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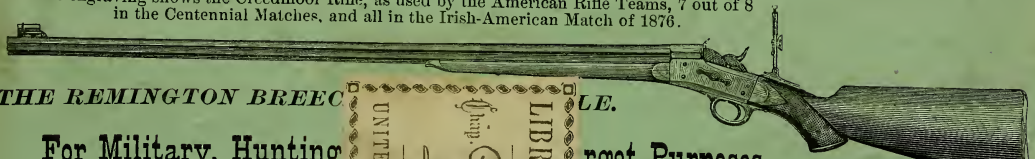
# The Remington Breech-Loading Rifle.

This engraving shows the Creedmoor Rifle, as used by the American Rifle Teams, 7 out of 8 in the Centennial Matches, and all in the Irish-American Match of 1876.



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# PREFACE.

In presenting the within conclusions, drawn entirely from original personal observations and practice, the writer has endeavored to savor them with a concise, conversational manner of presentment.

However unimportant little things may appear, none are overlooked here.

What has proved so perplexing with all other works on Rifle Shooting is herein avoided; each item having a separate heading, properly indexed, thus enabling the riflemen to turn instantly to the information desired.

The young rifleman will not necessarily be encouraged to enter the lists when he discovers that his pathway is beset with so many obstacles. It is *not* however the fact that satisfactory results cannot be obtained by beginners; and, once started, the infatuation with the science comes in the continued victories over these very obstacles. In all phases of rifle shooting it is a glorious fact that all of the difficulties treated on herein do not combine as an army to obstruct the path to the bull's-eye at one time, but, like the legions of the Army of the Potomac in its earlier history, they present themselves in detail for defeat at the hands of moderate skill.

The diffidence that the author might feel in treating so arbitrarily on the very many points on which the best riflemen honestly differ is overcome by the fact that no rules exist on competent authority to be overturned by the writer's treatment, and the conclusions are arrived at by the light that close attention and careful experiment can only give.

First in the field, opened out by the gallant work at Creedmoor, the author is the more encouraged to write with a free hand.

The system of diagrams is submitted with confidence of approval, as also are the pages for summary. These diagrams will prove equally valuable for mid-range work; as moderate shooting, with fine rifles, seldom calls for the inner and outer circles.

The Silicate Slate (green tinted for lead pencil), which must be bought with, and cannot be bought without, the book, will prove valuable for use on the range, and for keeping the book clean, which can be written up from the slate at leisure.

It would be egotistical and unmanly for the author to submit this work to the rifle fraternity without thanking Thomas Lamb, Jr., for the readiness, patience and skill which he has placed at the author's disposal, in the many experiments, necessary to a careful understanding of the subject matter under consideration.

Very Respectfully,

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# INDEX.


| | PAGE. |
|---|---|
| Accident | 20 |
| Acids | 17 |
| Aiming | 23, 25 |
| Allowance for Elevation and Wind | 32 |
| Ammunition, Loading | 20, 21 |
| Anger | 34, 36 |
| Angle of Hit | 33 |
| Anvil | 16 |
| Association Regulations | 45 |
| Attention | 34, 35 |
| Ball Starter | 18 |
| " Seater | 19 |
| Barometer | 30 |
| Beginning Score | 24 |
| Beginner | 13 |
| Borrowing | 35 |
| Bullets | 17, 19, 20, 36 |
| Cap | 16, 20, 36 |
| Cap Extractor | 18 |
| Cartridges, Loading | 20 |
| Cautiousness | 35 |
| Chambering | 14 |
| Cleaning Rifle | 21 |
| " Shells | 16 |
| " Rods | 21 |
| Clothing | 33 |
| Clouds | 26, 27 |
| Coaching | 35 |
| Cold and Heat | 29 |
| Contesting Shots | 34 |
| Conversation | 34 |
| Diet | 33 |
| Delaying Target | 35 |
| Direction of Wind | 29 |
| Elevations | 17, 26, 29, 30, 32, &c. |
| See headings that call for changes. | |
| Excitement | 34, 36 |
| Exercise | 33 |
| Experiment | 34 |
| Eye | 26, 27 |
| " Glasses | 26 |
| Figuring Elevations | 32 |
| Firing, Errors in pull off | 25, 36 |
| Fixed Ammunition | 13, 20, 21 |
| Fleeting Clouds | 26, 27, 28, 36 |
| Flinch | 23 |
| Force of Wind | 29 |
| Fog | 26 |
| Front Position | 24 |
| Funnel with Tube | 19, 20 |
| Generosity | 35 |
| Getting Elevations | 32 |
| Glass Spotting | 31 |
| Goose Eggs | 35 |
| Heat and Cold | 29 |
| Holding Plumb | 15, 24, 31 |
| Hygrometer | 30 |
| Keeping Score | 31, 35 |
| Kneeling | 23 |
| Leading (ledding) | 21 |
| Light | 28, 36 |
| " and Shade | 26, 27, 28, 36 |
| Line of Sight | 23 |
| Loading Implements | 18 |
| " Rifle | 20 |
| " Ammunition | 20 |
| Locality at Firing Point | 23 |
| Long-range Outfit | 13 |
| Low Position | 22 |
| Markers | 34, 36 |
| Measures and Weights | 19 |
| Mid-range Position | 23 |
| " Outfit | 13 |
| Mind | 34 |
| Mirage | 26 |
| Moisture | 30 |
| Muzzle-Loader | 14, 21 |
| Nerves | 23, 35 |
| Oil | 21 |
| Offhand | 23 |
| Outfit for Beginner | 13 |
| " " Mid-range | 13 |
| " " Long-range | 13 |
| Packing Cartridges | 20 |
| Patches on Bullets | 18 |
| Personal Habits | 33 |
| Plumbing Sights | 15, 16 |
| Politeness | 35 |
| Powder | 17, 19, 20, 36 |
| Position | 22, 23, 24, 36 |
| Protesting | 34 |
| Prone Position | 24 |
| Preface | 5 |
| Pull-Off | 23, 24, 25 |
| Pulling the Trigger | 25 |
| Quarreling | 34 |
| Reasons for Failures | 36 |
| Recapper | 18 |
| Rifle, Care of | 14 |
| " Cleaning | 21 |
| " Failures on account of | 36 |

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Rifle, Kind . . . . . 14
" Loading . . . . . 20
" Muzzle Loaders . . . 14
Rods for Cleaning . . . . 21
Rules and Regulations Association 45
Running for Train . . . 14, 33

Scales and Weights . . . . 19
Score Diagrams . . . . . 66
Shade and Light . . . 26, 27, 28, 36
Shades on the Sights . . . . 16
Shell Crimper . . . . . 18
Shells . . . . . 16, 20, 36
Shoes . . . . . 33
Shooting on Wrong Target . . 35
Sights . . . . . 14, 36
" Discs . . . . . 16
Sighting Shots . . . . . 24
" Errors in . . . 24, 28
Silicate Slate . . . . . 5
Snapping Shots . . . . 23, 24, 25
Spectacles . . . . . 26
Spirit Level . . . . . 15, 36
Spotting Shots . . . . . 31
Summary . . . . . 32, 162, 163
Sunlight . . . . . 26, 27, 28

Table of Differences in Elevation, &c. 32
Tables of Weights and Measures . 19
Talking . . . . . 34
Target—Shooting on Wrong . . 35
Targets—Small with Pegs . . 31
Team Shooting . . . . 39, 40, 41
Telescope . . . . . 26, 31
Thermometer . . . . . 29
Time . . . . . 36
Title . . . . . 3
Trajectory . . . . . 32
Tube with Funnel . . . 19, 20

Unaccountable . . . . . 36

Verdigris . . . . . 16
Vernier (see Elevations) . . . 15

Wad . . . . . 18, 21
" Rigby and Metford . . 18, 21, 22
Walking Fast . . . . . 33
Warming Shots . . . . . 24, 25
Weather . . . . . 25, 30
Weights and Measures . . . 19
Weighing Powder and Bullet . . 20
Wind . . . . . 28, 32, 36
Wrong Target, Shooting on . . 3



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## OUTFIT FOR A BEGINNER.

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## OUTFIT FOR MID-RANGE.

Satisfied to know more of the art, sporting rifles should next be employed; they involve cleaning after each shot. Three wiping rods, one for brush; a bottle of water, and a little sperm oil should be added. A good glass for spotting the hits is necessary, and a neat box for carrying the apparatus will be found very handy. A general remark as to the elements is sufficient, and ammunition, to be had ready made, is yet quite good enough. Here at mid-range, the eye becomes accustomed to the fine sights and the position becomes confirmed. Fine shooting is often the result at this range.

## OUTFIT FOR LONG-RANGE.

A fine breech-loading rifle, the best made, having pistol grip, a full sett of fine sights, Vernier, wind-guage, spirit-level, and extra front sight discs; loading implements, viz., recapper and cap seater, ball starter ball seater, shell crimper, funnel with tube, and scales and weights; barometer, thermometer, hygrometer, long-range glass and stand; ammunition and implement case, a fine score book, one wooden rod with brush, three wooden rods with slit, water bottle, oil and can and brass shells, powder, bullets and caps *ad libitum*.

## RIFLES.

It is not the author's intention to attempt a treatise on rifles, beginning with the one used on the ark. A few homely suggestions, as to generalities, will not interfere with the rifle makers altitudinous dome of thought, and may prove sign posts to guide young riflemen. If muzzle-loaders could be cleaned after each shot, with the same ease and certainty as breech loaders, they would prove much the best shooters, as they can stand lightning powder and hard bullets; and consequently very light rifling; as it is, without cleaning, they have, in the hands of the foreign teams, proved worthy of the highest consideration for accuracy, while there is little trouble in loading, none in cleaning, and no shells to cart around and pay for.

It is conceded, however, that the breech-loaders, made for rapid shooting, prove the best for fine work; as the rifleman is able to shoot from an absolutely clean barrel each time. Labor in cleaning, time in loading, expense and all other inconveniences, are as nothing in comparison with one more point on a good score. In a breech-loader look for a good, thick barrel with a pronounced but light rifling, minus all attempts at gaining twist; a fine breech action not liable to accident or to be sprung by the powder, chambered for a short shell, pistol grip and fine sights. All of the foregoing refers to fine long-range or mid-range rifles. For short-range a breech-loader that does not require cleaning more than once in ten shots, of almost any make, is good enough.

In the advertising pages each rifle of any note will probably be fully extolled, and in a manner more satisfactory to the owner than the author is capable of doing.

## CARE OF THE RIFLE.

Most men need no caution about taking care of the rifle. Its cost, beauty, and its response to calls to duty, all enhance the affection with which a gentleman regards his rifle. A man who will put his rifle away dirty, or defer its cleaning to a more convenient time will never shoot well. One experiment will prove the author's idea and cost the price of a new rifle. Ten minutes will prove sufficient time to enable the rifleman to clean and oil the barrel, action and lock thoroughly. Two or three *fooling shots* less, after the close of a string, will give ample time to clean up before you have to run for the train.

## SIGHTS.

Open or military sights, as at present made, lack even the appearance of genius that a savage might be expected to employ in their manu-

facture. There is no evidence, certainly in the sights, that a civilized individual ever gave their improvement a thought. The fact that many off-hand shots have been successful with them, reflects no credit upon the maker of the sights, but rather challenges the admiration of the world for their skill.

The same intelligence that a private soldier is required to employ in moving the slide of the rear sight to the required elevation could be applied in moving the rear sight right or left as a wind guage—especially, if (contrary to the sighting of all military rifles now) when moved up or down, right or left, the sights would cause the rifle to send a bullet on its proper course. The sight is too far from the eye and too cumbersome. Henry Ward Beecher once said, "Place a privilege in a man's hands and he will learn to enjoy it;" so the author says, place decent sights in a private soldier's hands and he will soon learn their use. How to use what we have is the subject for our consideration. For off-hand shooting, the lowest part of the middle of the back notch, the top part of the front sight and the white just under the bull's-eye, form a proper line of sight for a clear, still day.

For mid-range shooting the prone position is exacted with a military rifle. Invert the sliding bar of the rear sight, which then presents a flat surface; determine what *point* of the flat surface, always toward the wind, will be desirable to properly align the front sight and the white just under the bull's-eye with *it*, thus making allowance for wind; the sight having been previously blackened with the smoke of burning rubber; draw the file of your knife blade over that point just the least bit; a small bright spark will show which enables the eye to take the finest sight. A Vernier scale for guaging elevations with the sliding bar should be used. *Be careful to hold the rifle plumb.*

Sporting, *i. e.*, hunting guns are ornamented (?) with all kinds of hybrid sights, each one of the many requiring especial study as to how it can best be used.

Fine rifles, only, seem to have had proper attention in regard to sights.

The Vernier scale seems to be *the* thing; though the fine screw, which must be perfect for perfect work, is exposed to the danger of being damaged when it might just as well be shielded between the sides of the upright. The fine foreign Vernier sights are so divided that they can be used on the handle or butt of the stock with the same elevations; the divisions for the butt being proportionately larger, or assimilated divisions. Wind guages are necessary and should be made in hundredths of inches. Always screw the *barrel towards* the wind.

Spirit levels are as necessary as the sights, for if the rifle is not plumb the trajectory describes a side instead of its top curve and the bullet falls right or left low.

Above all, see to it that your wind guage block is centered properly, that is, so that if there is no wind, the wind guage stands at zero; that *it* is

plumb; that the Vernier is plumb; and that when they are plumb with *each other* and *the rifle*; that the *spirit level* is plumb with *all*. Front sight discs are made in great variety of patterns. Open bead supported by one, two, three, and four prongs; open bead and bar; split bar or Goodwin bar; callaper, fine, medium, and coarse; pin-head; and many others varying with the imagination and fancy of man. The open bead is more generally used by the Americans than any other. The bar-bead and callaper are used to advantage by some of our best riflemen.

The Australians use the pin-head, triple callaper and bar-bead. The Scotchmen use the Goodwin bar and pin-head, and the Irishmen mostly the Goodwin bar. The author recommends the pin-head for off-hand work and the open-bead for fine work; the latter sight can be varied in size of aperture and thickness of metal surrounding the aperture. The bar-bead covers the lower portion of the target. That sight which gives the eye an opportuity to see the bulls-eye plainly in position, and at the same time to casually observe the balance of the target, is in the author's opinion the best. Do not use a sight that compels the eye to be a judge of quantity of white allowed above, below or on either side of the bull's-eye, as you will be interfering with the uses for which the Vernier and wind-guage are especially employed.

## SHADES ON THE SIGHTS.

It is allowable and fair to have shades over your sights on fine rifles. By all means procure them and have them nice. The spirit-level above all should be shaded, as the eye can then see it to much better advantage. Shades are not necessary when the sky is, and is likely to remain, overcast.

## SHELLS.

Brass shells are the best under all circumstances. Steel shells have been tried fairly and condemned on account of cost, liability to split if they do not fit the chamber accurately, etc. Short shells, holding the powder, with one-eight of an inch to spare for seating the ball, are the best.

Not enough care is bestowed on cleaning shells. A residuum sweats the shell and dampens the new charge. Verdigris, in any portion of the shell, kills the gas of the burning powder and causes the bullet to drop low. Especially is verdigris in the cap holes fatal to good shooting. Warm water, a good brush and manual labor, backed up with plenty of ambition, will clean shells; then dry thoroughly in an oven, and finally wipe them well inside and out with a dry cloth.

See that the cap holes are free, that the anvil (if so objectionable a

thing is used) is in its place, and then seat the cap home below the level of the shell-head. All acids should be avoided.

## POWDER.

Muzzle-loaders, with no breech action to be strained, needing clean powder, using hard bullets, burn lightning powder to advantage.

Breech-loaders, that can be cleaned after each shot, burn slow powder to the best advantage; the powder, acting with gradual accelerating force, does not strain the action.

For muzzle-loaders, Curtis's & Harvey's No. 6 is generally adopted, and for breech-loaders, Hazard, FG is almost unamimously used. 90 grains C. & H., No. 6, are about equal to 105 grains FG. The initial velocity and consequent back action, at the instant of ignition, being greater—in fact too great for the action of the rifle. Laflin & Rand, No. 7 is about equivalent to C. & H. No. 6. At 1,000 yards, 90 grains of L. & R., Creedmoor, No. 1, requires 2 points less elevation than 96 grains of Hazard, FG.

It is natural to suppose that the science, being employed by the several powder companies, will, ere long, be productive of different brands that may take the place of the powder now used. Many riflemen are giving the L. & R., Creedmoor, No. 1, ample experiment, thus far without sufficient satisfaction to warrant its substitution for Hazard, FG. The FG is the cheapest, a great desideratum.

Keep your powder dry, *always*, the moment it gets damp it loses strength and evenness of quality, no matter how dry it may become subsequently. The thousand and one ways in which powder will gather moisture need not become a matter of experiment—simply and absolutely dry it must be kept.

The capacity of rifles to burn powder is widely different, some rifles reducing elevations until 110 grains have been used, while others do not change elevations for any amount over 95 grains. Find the capacity of the rifle and then use two or three grains more. In putting the powder in the shell, a tube from six to thirty inches long should be used through which to pour the powder; falling this distance it packs in the shell evenly; 105 grains can be put into a medium shell easily. A short shell with 100 grains are recommended for general use.

As long as the rifle will burn the powder 1 point for 1 grain should be allowed in elevation at 800, 900, and 1,000 yards.

## BULLETS.

There is no doubt that every rifleman desires some improvement in bullets for breech loaders. With slow powder, hard bullets do not always

upset; *i. e.* take the grooves evenly. Soft bullets lead (led) more freely than hard ones; and, while all of them may go on the target, they do not average as close in to the center as hard ones. Hard bullets, while measuring better on the target, are liable at times to miss entirely. Nearly every make of rifle has its special bullet, and so to recommend any would be an unthankful task. A difference of 10 grains in the weight of bullets calls for 1 point more or less elevation; this fact is a sufficient suggestion as to the importance of weighing bullets as well as powder.

There seems to be a constant desire existing, on the part of riflemen, to patch bullets better than they are patched at the factory. While there may be some little carelessness in properly performing this work, consequent on the ever absent sympathy between workman, or rather workwoman, and rifleman; and heightened by conversation, lunch-hour, late evening parties, etc, there is present, a *habit* of doing this special work, that is to greater advantage than the rifleman's personal interest and close attention. To supplant the paper used is another opportunity for experiment. It is not the author's desire to curtail such innocent amusement, but every rifle-maker in the country is doing his best to better the present patching and far more scientifically than shooters can do it.

In loading shells, care should be taken that the bullet fits the mouth of the shell, not too tight not too loose, that the bullet is seated just so far as another bullet, no farther. It is *not* strictly necessary that the bullet touch the powder—still too great a vacuum should be avoided.

One eighth of an inch is recommended as far enough to seat the ball. Use the ball-seater only to straighten the bullet in the shell.

## WADS.

For muzzle-loaders the Rigby and Metford wads are the best and only thing that should be used.

For breech-loaders NO WADS whatever should be used. The bullet should be seated directly on the powder.

## LOADING IMPLEMENTS.

The loading implements, mentioned in OUTFIT FOR LONG-RANGE, need but little attention here. Invention, common to our country, has given us the best. The instrument for extracting the cap and replacing it with a new one is perfect.

A shell crimper can be made by any machinist. A piece of steel one inch thick with a round hole of less calibre at one end than at the other is good enough; the difference in calibre should not be too great.

A ball starter should be a piece of steel capable of just fitting in the

hole of the shell crimper, for spreading open the mouth of the shell, with a convenient handle.

A ball seater is a piece of steel containing an exact duplicate of the chamber of the rifle and a portion of the barrel, with a plug sufficiently distant from the chamber, so that when the cartridge is made it can be inserted in this false rifle, seating the ball in the shell and straightening it. It is claimed that ball seaters are now made to perfection.

The funnel with tube can be improvised out of a tin whistle if necessary, care being taken to have the end of the tube crimped in or out, so that it will fit the mouth of the shell perfectly without entering it. The tube may be six or thirty inches long to suit requirements; the longer the tube the closer the powder will pack.

Scales and weights can be bought anywhere, but the author recommends the use of a fine article.

Mr. J. P. Waters, Assayer, No. 12 John St., N. Y. City, who is deeply interested in the art of rifle-shooting, and who is extremely courteous, has given the author permission to refer riflemen desiring something nice in this line to him; he will have scales and weights made to order for you and without charge for his services.

### TABLES FOR WEIGHTS AND MEASURES.

#### AVOIRDUPOIS WEIGHT.

Drachms.
16 = 1 oz.
256 = 16 = 1 lb.
7168 = 448 = 28 = 1 quarter.
28672 = 1792 = 112 = 4 " = 1 cwt.
573440 = 35840 = 2240 = 80 " = 20 " = 1 ton.
144 lbs. Avoirdupois = 175 lbs. Troy.
1 drachm " = 27⅓ grs. " or Apothecaries weight.

#### TROY WEIGHT.

24 = 1 dwt.
480 = 20 " = 1 oz.
5760 = 240 " = 12 " 1 lb.
Grains.

#### APOTHECARIES WEIGHT.

Grains.
20 = 1 scruple.
60 = 3 " = 1 drachm.
480 = 24 " = 8 " = 1 oz.
5760 = 288 " = 96 " = 12 " 1 lb.

The pound, ounce and grain are the same in Apothecaries and Troy Weight. In the former, the ounce is divided into 8 drachms, the drachm into 3 scruples, and the scruple in 20 grains.

7,000 grains, Troy, = 1 lb. Avoirdupois.
437½ " " = 1 oz. "

The above table will be found very useful in weighing out powder and bullets to load and reload cartridges.

1 lb. of Powder will fill 100 50 calibre, 70 grain Cartridges.
1 " " " 90 44 " 77 " "
1 " " " 77 44 " 90 " "
1 " " " 73 44 " 95 " "
1 " " " 70 44 " 100 " "
1 " " " 66 44 " 105 " "

Bullets for 50-70 cartridges, weigh 17½ to the pound.
" " 44-77 " " 16⅔ " "
" " 44-90 " " 12 8-11 " "

## LOADING AMMUNITION.

Fixed ammunition should have as much care in its preparation as any other detail necessary to good shooting.

Shells should be used but twice in the majority of breech-loaders; there are rifles, however, that will admit of the use of shells many times.

The shells must be absolutely clean.

The shells should be crimped or expanded at the mouth so that the bullets will fit uniformly.

The mouth of the shell should be smooth, so as not to cut the paper on the bullet.

Where the head of the shell swells or springs when fired for the first time, before recapping, put it in the ball-seater and, placing a piece of wood over it, to guide and receive the blow, strike it until the head of the shell is sufficiently flattened.

The cap should be seated deep; first, to make sure that it will explode; second, to have it below the head of the shell to avoid accident.

A scratch mark should be made on the shell to enable the shooter to insert it in the rifle the same every time, the scratch mark being on top. The shell will the better fit the chamber when subsequently used.

The powder should be weighed accurately, one charge right after the other, and carefully poured into the shell through a tube, with nothing to employ the mind until all the charges are weighed.

Weigh the bullets carefully, assorting them so that enough will be found of one weight for a day's work or at least for one range. With a lead pencil mark how far they are to be inserted in the shell. Insert them carefully with the fingers, the better to be assured that the paper is not torn or ruffled up; then, with the ball-seater, straighten them.

Carefully pack them in little boxes, that will contain 5 or 6 each, with paper or cloth to avoid shaking in transportation.

Never have two or more kinds of ammunition in your box so that you can possibly mistake one for the other during a score.

## LOADING THE RIFLE.

The rules of all well-regulated ranges are explicit in their injunctions as to putting the cartridge in the rifle. NEVER load a breech-loader except at the firing point, and then keep the muzzle towards the target. No possible amount of regret could ever repair the damage if by chance your rifle should ever once cause an accident. Many riflemen, on finding a cartridge fit tightly, seek a stump, and, grasping the hammer with their fingers, strike the breech block on the stump driving the cartridge into the chamber. The firing pin is in the center of the breech block; should it get caught and hit the cap, or should the cap be flush with the head of the

shell and the breech block set it off, disaster must ensue, for there is no support for the breech block, which cannot be locked till it is closed. This is true of more than one kind of rifle.

The muzzle-loader requires to have the powder weighed or measured carefully; the best method is probably to weigh the charges and put them in little glass phials—the bullets are specially prepared and do not vary much in weight. Oiled wads, which are intended to clean and lubricate the barrel, are manufactured expressly for muzzle-loaders. Press the bullet home carefully and, if conscious that the paper is disturbed in pressing it down, discharge the piece in the dirt and reload. A mark on the rod will indicate when the ball is home.

## CLEANING.

To describe the diversity of methods used in cleaning would be a task without equitable results.

First—Water should be used freely on a brush to rinse out the residuum of the powder. The brush should have a wooden rod to be used for nothing else.

Second—Dry flannel or Canton flannel rags should then be used with a slit rod so that the rags pass through and out and return, thus wiping the muzzle and avoiding the return of a bare rod, as in the case of a rod with a button. Continue wiping till the barrel is clean.

Third—A flannel rag saturated with oil should be used in another slit rod, same as dry rag, until the barrel is well oiled.

Fourth—A fresh, clean rag in another slit rod should be used to wipe out the oil. Habit will soon control this last wiping so that the barrel will be left uniformly clean.

A rifle will not lead (led) when cleaned as above.

A rifle will lead at times when not cleaned as above.

Four rods are necessary, and no more cumbersome than one.

Be careful that there is no metal on any rod in such a position as to scratch the barrel.

Lance wood rods, while more costly at first, last longer, have greater strength for less thickness and are nicer in every way than any other.

Don't let any one inveigle you into the lazy habit of "a rub and a go." You might just as well shoot out of a muzzle-loader and thereby save much more trouble. Men who are too lazy to clean out their rifles, thoroughly, will draw a picture of their laziness on the target, if perchance the bullets all get there. Too much oil or water in the barrel is only a different kind of dirt.

## OIL.

Never use sweet or olive oil. Never use kerosene oil. Sperm oil and

sewing-machine oil are the best. The latter can easily be procured at any sporting emporium.

Rigby and Metford wads used in loading are also full of oil for lubricating these famous muzzle-loaders. Some riflemen use them to lubricate breech-loaders. They are not intended for, and do not subserve the purpose as well as oiled rags.

## POSITION.

In endeavoring to favor certain positions the writer is not unaware of the difference in the formation of men. What will suit one cannot suit another. The author is free, however, to state what positions should be avoided. Do *not* put the *butt* in the *left arm pit*, the shock will affect the *heart*. Do not recline the head on the stock in such a way that the recoil or bound will jar the head—injury to the head and poor shooting at the last range will be certain. Do not hold the butt plate in the hand on the side from which the shot is fired, the arm being twisted in an unnatural shape will soon tire out and cause unsteadiness, and the recoil often times gets the better of the hand, causing the sights to strike the eye. Lastly, do not waste any time experimenting with a fine rifle in the prone or front position. It is safe to aver that the next International match will find all of America's opponents on their backs. The "Farquharson" position, commonly known as Fulton's position, is made up by bending the right knee about the left ankle, thus forming a crotch to support the barrel, the stock, passing by the head over the right shoulder, is seized at the butt plate by the left hand, the head resting on the left fore arm, the right hand at the trigger. This position is varied by grasping the thick of the barrel with the left hand and resting the head on the stock, the recoil or rather bound is too severe for the head, and the hand does not always hold the recoil with the same degree of firmness. This latter position is still further varied by turning the body well over on the right side, the barrel resting on the left thigh. The objections remain the same. The position adopted by the Australian Team, said to have been first used by Fraser of the Scottish Team, is somewhat varied by different marksmen, and is the strongest position. The legs disposed as in the Fulton position, the butt of the piece resting in the right arm pit, the left hand supporting the head, right hand at the trigger. General Dakin varies this by putting the left hand behind the butt plate in the arm pit, the hand serving as a cushion to check the recoil. Allen uses the left hand at the swell of the barrel, pulling the butt into the right arm pit to reduce the chance for recoil. With these latter positions, the Vernier sight can be placed on the heel of the butt lengthening the leverage of sight. The Milner position is strong, with the exception that it is a very low one, the toe of the butt must almost touch the ground (see Mirage). The knees bent to the left allow the

barrel to rest on the toes of both feet, the butt well in the arm pit, the left hand on the stock to plumb the piece, the right hand at the trigger.

Do not change locality at which you lie down during a score; ten feet nearer to or further from the target will change elevation one half point or more.

## OFF-HAND AND MID-RANGE WITH OPEN SIGHTS.

The following rules, written some time since by the author, and styled A, B, C's, are simple, terse and seem to cover the ground thoroughly :

RULES.

Stand erect on both hips, feet at right angles conveniently apart and firmly planted.

Press the butt against the shoulder with both hands, the left hand grasping the piece firmly at or in front of the lower band. The left elbow under the piece, the right at the hight of the shoulder.

Do not put the elbow against the body, as such a position is fatal to good shooting. If it were possible to so conform the body that the left elbow could rest on the hip and not touch the body, the position of one of the best off-shoulder shots we have would thus be attained, and prove the only exception to the rule.

The lower part of the middle of the back notch, the top part of the front sight and the white just under the bull's-eye, forms a proper line of sight for a clear, still day.

If the wind blows across the range aim a little toward the direction the wind comes from.

Stop breathing when about to fire.

Pull off with the second joint of the second finger, pull slowly till the piece fires; a jerk will spoil the shot and oftentimes pull clear off the target. If the shot goes off the target to the right aim to the left of the bull's-eye to counteract the error. It would be better to amend the error of pulling off which alone causes the difficulty. Keep the eye open and observe the aim until after the shot is fired, a flinch or fear of the explosion will enhance the kick of the piece and demoralize the nerves. Practice in aiming and pulling off without cartridges should always be had at the firing point before firing. The sights should be so arranged, temporarily for this practice, that after pulling off, the aim can still be maintained ; any deviation on account of firing can thus be noticed.

The author has no kind words for the kneeling position. With breech-loaders, troops should be allowed to lie down, even at 200 yards. A man is better self-possessed, more sure of his aim, more safe and better under control when lying down. A man standing, with the enemy close in front is so preoccupied in loading and firing that his legs often get the better of his judgement and courage; causing him to run into unecessary danger (?)

The front position is demanded in military shooting. The author thinks this demand erroneous. When the enemy is retreating, a fixed rest and certain aim, even at the cost of an instant of time, is better than supporting the body as well as the rifle on the arms. When it comes time for retreat the rifleman can turn over from his back and run twice as quick as he can gather himself from the prone position. When he turns over from the back position, his face is in the direction whither he desires to amble. The prone position should be thoroughly studied. Short-armed men may not be able to take the position recommended by the author, but they should approach as near to it as possible.

If the target is at the north, face the north-east and lie down in that direction; strike the toes well into the ground, and settle the body down as low as possible; throw the left elbow over to the right, grasp the piece with the left hand from underneath, the fingers reaching as far around as possible; back of the hand to the right. As the muzzle of the piece is carried over to the left, to its proper alignment, it puts every muscle of the left arm on tension, and consequently there is no joint to wriggle or shake. The butt should be placed against the right shoulder, passing along and by the collar bone. The right arm is free to manipulate the piece.

To make a crotch of the two forearms, and put the piece against the collar bone, is to have the bases of that crotch on the uncertain cartilage of the elbows and the butt where it can hurt you most. In the position recommended, the left elbow is not under the piece but to the right of it. Long-armed men will grasp the piece at or near the sight rack; short-armed men near the breech.

The pull off here should be very slow and perfect. In no case should the piece be spasmodically set off, as if catching the target on the wing. Be sure to hold the piece plumb; it is easy to make a sufficient error, when not doing so, to throw the shot off of the target altogether.

## SIGHTING AND WARMING SHOTS.

"Sighting shots" is a term generally employed to designate actual shots, allowed previous to the beginning of the score, for the purpose of securing elevations and windage. In long-range shooting these are being discarded so as to determine relative science in judging elements on the first shot. Never take sighting or trial shots on practice days; begin your score on your judgement and if the result is a miss, take it, and do better next time. This discipline is of incalculable value. Sighting shots, as the author would consider them, might be called snapping shots. Without a cartridge, to take position at the firing point and go through the motions of aiming and firing, determines the degree of steadiness and accustoms the eye to the sight. Many of our best shots do this, without ever giving themselves a reason why.

Warming shots are blank or ball cartridges exploded in the gun to warm it to an even heat before beginning a score. A difference in elevation, in the first three or four shots, is found by nearly all marksmen, which is accounted for by the difference in the heat of the gun.

Snapping shots are equally as valuable as warming shots. Three blanks fired in position, aiming at the target, accustoms the eye to its work, and one ball cartridge then blown off will prepare the rifle for use. The writer holds that this precaution will obviate any change in the first shots that might not be required in the last.

Snapping shots should be taken at home. A few leisure moments spent in this way strengthens and confirms the position and vision.

## AIMING.

Off-hand shooting which generally results best with open sights, often calls for the shooter to aim away from the bull's-eye. Being so near to the target, this is not so hazardous as at longer ranges where a man judges one foot, at its full measurement, on a target that is reduced in size by distance. Always have the open sights sufficiently elevated so that in aiming away from the bull's-eye it is not hidden from the view. It is always best with fine sights to make the changes on the gauges and aim dead on. If however, a rifleman insists in aiming so as to allow for any change that may take place in wind or light or shade while he is in the act of aiming, if using an open bead the bull's-eye appears in the middle and a white circle around it, covering the white on either side or top or bottom is equivalent to one point of wind or elevation. It is therefore obvious how much care should be used in holding the bull's-eye in the center of the open bead, with an equal showing of white around it.

## FIRING OR PULLING THE TRIGGER.

When about to fire, inflate the lungs moderately and then hold your breath till the bullet is gone. The pressure of the finger on the trigger should be very slow and steady so that when the hammer trips the steadiness of the rifle is not disturbed.

## WEATHER.

All other things being equal, a cloudy, moist, warm day gives lowest elevation; and a hot, bright day, or a very cold, bright day, highest elevation. In the first instance there is no mirage, the eye is comfortable and lubrication is freer, *i.e.*, the residuum of powder in the barrel is soft; on the hot day the eye is strained, mirage constant, and the powder cakes in the

barrel causing friction and often causing the barrel to lead (led) from the bullet. These general rules are more or less modified by wind direction, season of the year and condition of the ground, if wet or dry. At times fog settles like a wet blanket, often totally obscuring the target. Plenty of time in sighting will give less variable results than raising or lowering elevations, as the fog is more or less dense.

## MIRAGE.

Careless observers, even, have noticed that heat rising from a stove causes the atmosphere to dance, and distorts images behind it; so casual observers notice on a sunny day that between them and the targets there is a dancing of the atmosphere. A powerful telescope becomes almost worthless from the fact that this dancing appears to assume the consistency of a river running by. This is what some of the Irish Team of 1874 called "Gin and sugar," but is what we call mirage. To penetrate this consistency of the atmosphere, according to science, with set rules, has not as yet been attempted, although no one will be found unwilling to acknowledge its importance. A cock of hay in front of the bull's-eye will send up enough mirage to join it to the bull's-eye, making it impossible to take sight. A cloud covering the range will entirely disperse the mirage, so we must admit that the sun's rays are necessary to produce mirage; as the heat rising from a cock of hay does not stop rising on account of a cloud, but because there are no sun's rays to refract, we are unable to see the heat and it no longer serves as an obstacle. After securing elevation, mirage indicates its intensity or diminution best through a fine telescope. Set the glass on four legs, put together on the principle of a saw horse. Set the cross hairs so as to cut the exact center of the bull's-eye. The bull's-eye will appear to lower as the mirage increases, and rise as it diminishes. If the bull's-eye lowers so that the cross hairs cut the top, four minutes more elevation are required; that is to say, each 4½ inches (actual) of the bull's-eye *above* or *below* the *cross hairs*, indicates one minute less or more of elevation. In other words, each $\frac{1}{8}$ of the bull's eye, as cut by the cross hairs, equals one point of elevation. Mirage disappears when a cloud covers the firing point and 300 yards toward the target. Should the sun shine on this portion and shade cover the entire balance of the range, including the target, the mirage is not interfered with. Should the first instance occur, with bright target, less elevation is needed. Should the second instance occur more elevation is needed. Should the entire range be shaded by a dark cloud the absence of mirage equalizes the darkness as to elevation; plenty of time being taken in sighting. Bright sunlight succeeding requires much less elevation, for the time, mirage coming on again requires a slight creeping up in elevation. The lower the line of sight the more dense the mirage. The rifle can be sighted much better at the

height of the shoulder than on the ground. The writer holds that all low positions fail perceptibly on days when the mirage is dense enough to be an obstacle at all.

## EYE.

In no treatise on rifle practice, as yet known, has the eye received the least consideration. In making so extended a paragraph the author desires to develop criticism and thereby develop experiment on this very essential feature. It is a fact, that in warm weather, grey and blue eyes make better shooting than dark eyes. In pronounced cold weather the difference is not as marked, still very few dark eyed men have achieved success as marksmen. All of the members of the American teams have been light-eyed men.

Shooting from the same position a dark hazel eye requires 1½ minutes less elevation at 1,000, yards than a blue or grey eye. It it safe to assert that no marksman has yet been known with a black eye—(unless we except a few temporary ones belonging to riflemen whose peculiar positions have caused them—of one of these positions, one of the Scottish team remarked, that "he looks like a crab on a skewer.") There must be a reason for all this, and it is a natural as well as a philosophical conclusion that the less dense the iris the less the variation of the pupil. On this principle, also, are we to to account for variation in elevation consequent on light and shade. We have only to recall the fact that the pupil of the eye, opens and closes to a greater or less extent to accustom itself to each new object to give force to the idea that each shot should have a uniform time given to its sighting; and that the eye should traverse the same objects, as nearly as possible, between shots, to retain for it an equal power of vision. An exaggerated example may draw attention to this topic more forcibly, viz.: no one can look at grass for some time and then suddenly look at the sun and endure the light any more than he can, after becoming accustomed to the intense sunlight, turn to mundane objects and see them clearly at once. On a very bright day it is not unnatural for a marksman when awaiting his turn, to look at the very bright target, while before the very next shot he might find himself looking at the ground, or at his score book, or at a brother marksman. Such opposites must be avoided. The author claims as part proof of the above that elevations are not as bothersome on cloudy days as on bright days. Perhaps the best way to control the whole matter is for the rifleman to observe a certain interval, after he has properly obtained sight and before he pulls the trigger, to allow the eye to become fully assured of its observation. In this way, better than any other, can the marksman lessen the influence of fleeting clouds. It is a fact, though disputed by some, that, on a bright warm day, a heavy cloud covering the range calls for more elevation, unless the eye is given ample time to penetrate the darker atmosphere; and the

change is more marked, when the cloud, after obscuring the range for a few minutes, passes away and renews the bright light. The writer holds that *then* every rifleman must lower elevation.

It often occurs, on days when fleeting clouds are the rule, that as the marksman has found his aim and is about to pull off, the bull's-eye leaves the sight, notwithstanding the fact that he is, and that he knows he is, holding perfect. Beware of following this *Ignus Fatui* too quickly; for, while the eyes see differently, the target has not moved. Shutting one eye is getting out of date as it develops one eye to the exclusion of the other, and causes nervous twitching, especially in hot weather. A leather screen or other contrivance will shut off its vision, so the eye not in use can remain open.

The use of eye glasses should be avoided. Spectacles are but little better; while the snobbish single eye glass is not only in very bad taste but fatal to decent shooting. Colored glasses, that simply shield the eye from bright light, counteract their usefulness by a percentage of loss equal to if not greater than the gain.

There is probably no influence of greater benefit to short sightedness than long-range shooting.

## LIGHT.

In order to a proper understanding of the influence of light on rifle shooting, the reader will have to give close attention to the articles on EYE and MIRAGE. Some hints are necessary on the general topic. Could a rifleman select the peculiar light best adapted to his success and comfort he would choose a dull gray light natural to a completely clouded, but not threatening sky. A very bright light tires the eye and produces mirage. That light which permits the full power of a fine telescope is the best and most regular. Rain-light is preferable to sunlight. Sunlight calls for almost constant and sometimes radical changes in elevation. An entire score may be fired without changing elevation in the absence of sunlight.

In figuring up the elevation at which to begin a score light should be given a prominent consideration.

## WIND.

All publications extant make an enormous bug-bear of wind, and the young rifleman has thus far left that, if he did not screw his wind gauge out of all correspondence with his previous shot, he would certainly miss the target, and make himself a target for the jests of his companions. The distance covered by the ball makes the opportunity for wind currents to equalize their force. What may appear to be stronger at 200 yards distance, is balanced by less force at 500 yards; so, before learning

any other rule, learn this: BE SLOW TO ALTER YOUR WIND GAUGE.

Wind—Direction is marked by the clock dial, the shooter standing at 6 o'clock, the target at 12 o'clock. A 3 o'clock wind is blowing from the right, a 7:30 o'clock wind from the left rear, and so on.

Wind—Force is kept by the letters A, B, C, D, E, F, marking a gentle, moderate, fresh, strong breeze, a half gale, and gale. The wind gauge is kept 5 L or 5 R as the *barrel* is moved *toward* the *left* or *right*. The number of points of wind desirable can only be estimated after finding the direction and force; for, if the wind be blowing a gale from 12 or 6 o'clock, no windage is needed (except to cover the drift, which is enhanced by a rear wind); while a 3 o'clock gale might require 15 points of windage. A wind that holds from 8 to 10 o'clock; or 2 to 4 o'clock, offers less opportunity for skill than one from 10 to 2 or 4 to 8 o'clock. These latter are called "fish tail," and are troublesome on account of changes in elevation. A front wind, say force D, requires about 4 points more elevation than a rear wind. A strong side wind causes the ball to describe a side as well as top trajectory and needs more elevation, but not so much as to be troublesome. Five points more of side wind needs one point more of elevation.

The best way to study wind is to get a happy medium, and shoot away, pretty lively, without changing anything, making careful and honest notations of your best judgement before shooting, as to force; and after shooting, as to position of hit on the target. Errors can thus be accurately corrected. Above all, when aiming, be careful not to let the wind *blow up* without noticing it, and, the first thing after shooting observe the wind—*the wind in which* YOU SHOT.

## THERMOMETER.

This instrument is probably more valuable in indicating the condition of the metals, as influenced by heat and cold, with a view to keeping track of friction than for any other purpose. Rules that will apply in warm weather work to the contrary in cold weather. In Summer, with the heat at say 90°, the ground is dry and unable to give the air its proper absorption of moisture, one 40th of its weight; the metals are more nearly assimilated and friction greater; and the metals, responding to the grateful approach of cool clouds, relax as does the human body.

A dropping of the thermometer 5° should be an indication for 1 minute less in elevation. In Winter, with a bleak cold atmosphere, the thermometer down to 40°, the atmosphere is incapable of holding more than one 140th of its weight of moisture; an increase of temperature seems to act on the metal as on the body creating a genial feeling, and, directly opposite to its effects in Summer, indicates less elevation. Do not condemn this rule on account of the contrary actions of mirage. To name dates when it would be safe to arbitrate by rule is, in our very changeable

climate, hazardous. Let the rifleman be influenced by the hygrometer or his bodily comfort, diminishing elevations as the temperature changes from uncomfortable heat to cooler and from uncomfortable cold to warmer and *vice versa*. In Summer time, as evening approaches and the thermometer begins to fall and the air and moisture equalize, let elevation go down correspondingly. In the Fall and early Spring, evening comes on more rapidly and, the light growing darker and the air colder and less moist, calls for more elevation.

## HYGROMETER.

The hygrometer determines the amount of moisture actually in the air. The thermometer will perform the same duty if a sufficient amount of moisture is present to be absorbed or deposited in such proportion as the heat is greater or less. Plenty of moisture in the ground is all that is necessary to secure, by known laws and a thermometer, the information given by the hygrometer. In Summer when the ground is very dry, or in Winter when a cold brisk wind is blowing, the hygrometer is necessary to adequately arrive at the amount of moisture in the air. This instrument is necessary therefore, in connection with the thermometer, in accurately determining how much allowance should be made for friction. While these rules are perfectly essential for rifles that are not cleaned, between shots, they lose much of their force; when applied to rifles that are cleaned properly, (see cleaning rifles), nearly all influence of friction being thus removed.

At 32° F. the air should contain one 160th of its own weight of moisture for every additional 27° F., the capacity of the atmosphere to contain moisture doubles.

In the score diagrams, thermometer and hygrometer are used as separate terms, for the reason that the thermometer needs to be consulted by itself. Hygrometer consists of a thermometer proper and a thermometer with a wet cloth on the bulb, known as the dry and wet bulb thermometers. The wet bulb always registers lower than the dry one, so to record the dry bulb as a thermometer and the wet bulb as the hygrometer, makes "two bites of one cherry," and serves all purposes.

A close remark of the weather and moisture of the ground will relieve the shooter from the necessity of having a hygrometer, especially if he uses a breech-loader and cleans it properly.

## BAROMETER.

Nearly every marksman acknowledges to a fluctuation in elevations corresponding to the rise and fall of the barometer, still, few give it a prominent place in influencing their judgement. A careful study has

given the writer the opinion that, whenever elevations change from unknown causes, the sequel, instead of the warning, is found in this instrument.

Nothing, but heavy clouds and bright sunlight alternated, ever produces a radical change in elevation that does not thoroughly indicate itself in the barometer; and, if a shot held steadily gains or loses slightly in elevation, instant recourse should be had to the barometer for the solution; carefully following its fluctuations the shooter need have no further trouble from that quarter.

## SPOTTING THE SHOTS WITH A GLASS.

No long-range rifleman should be without a good glass. Great power is not as essential as clearness. Many small glasses are clearer and less affected by mirage than larger ones. To locate a shot by the unassisted eye and the marker's disc is too vague; a glass must be used and the exact spot hit should not only be noted, but accurately noted on the score book. Many marksmen, more egotistical than wise, favor their record by marking their shots nearer the center of the target than they actually hit. Don't ever fall into so great an error. Small wooden targets, with draughtsmen's pins numbered, are nice to have, but are no better than the target in the book.

## KEEPING SCORE.

The most important of all requisites to good shooting is an *accurate* record of EVERY SHOT fired, whether fired in a score or as an experiment, or to kill time, or to shoot away bad ammunition. Months after you have forgotten such mistakes as you keep out of your book, for looks sake, you will regret it, if you cannot find the bad and the reasons, so as to avoid like disaster. Be honest *with yourself* in keeping your score book. You are not obliged to show it, if it is bad, and you will never succeed if you shoot so bad that you are ashamed to know it yourself. In keeping your elevations, if you notice that a shot is a little high or low, be slow to change unless you are sure you held the rifle perfect. *It is best to hold the rifle perfect every time;* if it takes ten minutes to get up, get rested, and try it over again. If a shot hits the bottom or top of the bull's-eye it is safe to change ½ point up or down. If a shot hits above or below the center circle, 1 point can be allowed safely, unless the error comes from light and shade, and the original conditions are restored. Be very careful of *the next shot always*, so as to make sure of the necessity of more alteration.

## ALLOWANCE FOR ONE POINT IN WIND OR ELEVATION.

The table of differences, submitted below, is subject to slight changes on account of distance between the sights on the rifle, powder charge, bullet, weather, difficulty of moving the sight *exactly* one point, eye sight, etc., etc.

The difference given is for inches on the face of the target, not what it appears to be by guess work.

Grip and butt refers to where the rear sight or Vernier is located; a desired result requiring *less alteration* on the scale of a Vernier or wind gauge when the rear sight is on the handle than on the butt. Measure your divisions and allow *pro rata*, more or less, as they are greater or smaller than the divisions in the table.

TABLE OF DIFFERENCES FOR ONE POINT OF ELEVATION OR WIND.

| | Divisions 1-100 of an inch, Vernier and Wind Gauge. | | Divisions 1-60 of an inch, Vernier and Wind Gauge. | |
|---|---|---|---|---|
| Yards. | Vernier on Grip. Inches. | Vernier on Butt. Inches. | Vernier on Grip. Inches. | Vernier on Butt. Inches. |
| 200 | 2 | 1 1/16 | 3 1/16 | 2 1/16 |
| 300 | 3 | 2 1/16 | 5 | 4 |
| 400 | 4 | 3 | 6 3/16 | 5 1/4 |
| 500 | 5 | 4 | 8 1/16 | 6 1/2 |
| 600 | 6 | 4 3/4 | 10 | 7 7/8 |
| 700 | 7 | 5 1/2 | 11 3/16 | 9 1/16 |
| 800 | 8 | 6 1/4 | 13 1/16 | 10 1/16 |
| 900 | 9 | 7 | 15 | 11 3/4 |
| 1,000 | 10 | 8 | 16 3/16 | 13 |
| 1,100 | 11 | 8 3/4 | 18 1/16 | 14 1/16 |

## SUMMARY.

The pages inserted for keeping a summary, if properly kept, will prove invaluable. The eye, taking line after line, finds elements and conditions, noted on previous days, similiar to those that present themselves for the marksman's judgement at the commencement of a new score. To start a score by guess work, or on the advice of a brother rifleman, is unscientific and lazy, and entails incalculable disgust if perchance the guess is erroneous. Some day when you are real anxious to do well, just start a score with a "goose egg" on guess, and you will find the hinge-pins of your nervous system rather loose, to say nothing of th swearing tackle of your lower jaw—(inelegant but forcible).

DO NOT BEGIN WITH YOUR WINDAGE ON THE WRONG SIDE OR YOUR ELEVATION 5 OR 10 POINTS TOO HIGH OR LOW.

## TRAJECTORY.

This is the term applied to the parabola, or line actually described by

the bullet consequent on the action of two or more forces, viz: the propelling force of the powder, attraction of gravitation and wind. The example used to explain the angle of hit on the target would probably be actual with 90 grains FG powder, and a 550 grain bullet at 800 yards, and is sufficiently accurate for all purposes. A bullet leaving a rifle at a velocity of (in round numbers) 1,000 feet, the first second would go 800 feet the second, and 600 feet the third, total 800 yards. At the end of the first second, the bullet would be 28 feet from the ground, 16 feet below the line of fire; at the end of the second second, it would be 32 feet from the ground, and 48 feet below the line of fire; at the end of the third second, it would be on the target, 107 feet below the line of fire. Dropping 32 feet in the last 600 feet, the angle of hit would be *one* inch fall in *twenty* inches, 3° less than horizontal.

The difference is so immaterial that it should be discarded in making allowance for faulty elevations. The slightest zephyr of wind, or difference in light, or error in holding, is more material. (For influence of wind on trajectory, see WIND.)

## DIET—PERSONAL HABITS.

Little need be said on this topic; riflemen given to excesses in eating and drinking are unknown. Moderate living, very moderate drinking, including coffee, moderate tobacco, better none at all, are absolutely necessary. While it is better not to get hungry, such a condition is preferable to a full stomach. A peach, pear, or apple will quench thirst and a sandwich is all sufficient for lunch.

## CLOTHING.

In warm weather bodily comfort will be a proper guide as to clothing. In cold weather an overcoat is worn until at the firing point it is discarded as too cumbersome; the result is, that the body becomes cold if not shivering. Double flannels and stockings accomplish warmth and freedom of action. Rather be too warm than chilled. Always wear heavy shoes on the range.

## EXERCISE.

Plenty of moderate exercise is recommended except gymnastics.

One important thing should be fully observed—never run for a train or walk fast on the day of shooting, better turn back home and save expenses.

Never try to accomplish too much in one day, all will prove good for nothing.

## EXPERIMENTING IN A MATCH.

Granting that candor rather than ill-luck has actuated riflemen in many instances within the writer's memory to ascribe their misfortunes to experiments, we can reach but one conclusion, never experiment in a match. Cartridges loaded by a friend eighty years old; bullets patched with sized paper; sights shaded one shot and minus a shade, which has dropped off the next; powder of different make, quality or quantity; powder crushed by seating the bullet too far; patches oiled, or rifled oiled in the middle of a score, and a thousand other peculiarities, all explain *bad luck* but not BAD TASTE.

## CONVERSATION.

Any talking at the firing point, such as telling stories that superinduce laughter; discussions of an animated or quarrelsome character that call for serious reflection; and, especially, that excites the prejudices, will certainly interfere with good shooting.

The mind should have but one object in view, viz.: that collection of details which is necessary to make the next shot a bull's-eye. The introduction of *any* subject foreign to such details occupies the mind to the exclusion of some one of them.

Never quarrel. Never impose your excesses on others, whether resulting from good or bad luck.

## PROTESTING.

Never protest against any action of a fellow rifleman. You may be misjudging his motives or his acts, and, in his mind, you may appear to be doubting his honor. He will never forget it. If anything flagrant is being done, that is interfering with YOUR success, quietly call the attention of the official in charge and allow HIM to take the responsibility of rectifying the matter.

Never yield a shot, if honestly in doubt, where *it* can affect *your score* so as to secure a *prize* or *requisite standing*. You are entitled to contest a shot not scored by the marker, and no honorable rifleman will find fault if you seek what *you believe to be right*. Be slow to contest shots while you are yet young in rifle practice. Beginners are always complaining of bad markers.

ALWAYS TRY TO PUT YOUR BULLET WHERE THE MARKER CANNOT FAIL TO FIND IT.

## DELAYING A TARGET.

A large majority of all contested shots end in "goose eggs." Few instances occur wherein contested shots if allowed would alter results. Remember that while you are in dispute you are delaying the target; you are losing track of elevations, wind, &c.; your gun is getting cooled off; and you are disturbing your equilibrium of mind, and making your comrades on that target equally miserable.

## SHOOTING ON THE WRONG TARGET.

The worst delay that you can be guilty of is putting your bullet on another target. A bullet so put almost invariably hits the bull's-eye, making your loss five points, giving the adversary then firing on that target a choice of, say, his outer and your bull's-eye, and may result in blinding the marker, and keeping that target idle, with the danger flag in front for over half an hour.

## COACHING.

Politeness demands that you do not bother other marksmen with questions, which, if properly answered, would assist you to defeat them.

Generosity demands that when you are interrogated you answer to the best of your ability.

Cautiousness demands that you should couch your answer so as to relieve you of any suspicion if the information should fail to bring success.

If you are keeping a comrade's score for him offer no suggestions until they are called for.

If a comrade is keeping your score, be free to tell him, beforehand, what suggestions, if any, you desire him to make from time to time.

If you are being "coached" submit entirely to the judgment of the "coach;" improving the opportunity to correct your ideas with his success, or to note the reasons for his errors.

## BORROWING.

It is unpleasant just as you are going to the firing point to have a comrade "sing out" for a screw driver, oil can, ball seater, or to ask what o'clock it is, or how the barometer or thermometer stands, &c. Every shooter should have his own kit.

## REASONS FOR ALL FAILURES.

To undertake so grave a task, as is indicated by this caption, is not self imposed. Challenged and requested, the author remembers that he started to write with a free hand; so, like a line of battle, with only a knowledge that the enemy is somewhere in front, we will commence firing, let the shots fall where they may, always hoping that some will take effect.

RIFLES.—Too deep rifling, worn out rifling, badly chambered, effect escape of burning gas, *un*uniform rotary motion of the ball, and uneven upsetting of the bullet.

SIGHTS.—Jumping of the sights during the recoil of the previous shot, the screw not being tight enough, sights not properly plumbed, causing wind-gauge or Vernier to act laterally, screwing the wind-gauge to the wrong side.

SPIRIT LEVEL.—Not properly sighted.

CAP.—Uneven action on account of verdigris, &c.

SHELL.—Improperly cleaned.

POWDER.—From moisture, verdigris or foul shell.

BULLET.—Badly seated in the shell, paper ruffling when inserted in the shell or rifle, paper adhering to the bullet after it has left the muzzle, paper leaving the bullet before it leaves the barrel, causing the rifle to lead near the muzzle.

POSITION.—Difference in recoil consequent on positions wherein the rifle is not held firmly at the butt. A rifle recoiling without hindrance will throw a shot higher on the target than one fired from a post.

SIGHTING AND FIRING.—Of all the misses made, charge better than fifty per cent of them to this cause; thirty of the fifty per cent being attributable to pulling off, and the remainder to mistaken vision common to the best riflemen. It is often the case that, after a long effort to secure a good sighting, the shooter gets tired out, and, although not satisfied with the sight, concludes to let the shot go under an agreement with himself that he will take more pains with the next.

ANGER or excitement of any kind.

WIND, light and shade.

TIME.—Unusual lapse of time between shots.

MARKERS.—Nearly all young riflemen charge their misses to bad markers. Don't display your ignorance of the art in that way.

LASTLY.—Obey established rules and the dictation of your intelligence, and your misses will be narrowed down to a very few unaccountables, at present beyond the power of human ken.

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## TEAM SHOOTING.

There are two ways in which the author can attack this subject; one in pointing out the defects of the methods used at Creedmoor during the International matches; the other in simply prescribing what seems to be the correct method. The latter will be less calculated, perhaps, to meet the desires of those who were connected with the several teams, but will also be less calculated to draw out animated defence of methods used which the author might consider erroneous. Let us then try to build a fabric on its own base and not on the ruins of the past.

### DISICIPLINE.

To have discipline is to have instruction, government. In an art like rifle-shooting, it would be unwarrantable to assert that one man could be master of all its points, and it is therefore necessary to have a system whereby all can impart their information for the instruction of others. The system calls for government and to that end a central power for arbitration should be vested in one man as captain, and a coach for each target, to be a receptacle for the information to impart it to the next shooter, together with his further observations of the elements. None of them to be of the firing members. *Simply to be arbitrary is not discipline.* There must be respect and confidence, first between the shooters and their coach and finally for the captain.

### SYSTEM.

There should be a spotter with a fine telescope for each target whose accuracy is unerring, and a score keeper to dot the hits on each man's target, and to keep accurate record of his elevation and windage, both under the control of the coach. The coach should have a fine glass set for his use, only in case of dispute, and a pair of field glasses with which to watch for wind currents.

The first man in position firing, the second man should be standing by the side of the coach intently observing the wind and instruments for himself, the coach watching for changes in light and wind for No. 1. The instant No. 1 has fired he should arise, without loss of time and *without trying to outdo the spotter in trying to discry the locality of hit,* and go to the coach giving his elevation and windage; immediately retiring to reload, the coach observing the position of hit and any alteration in the elements, imparts his opinion to No. 2, who immediately takes position; No. 3 taking the place of No. 2 and so on.

In no instance should the coach keep the record or spot the shot, or attempt to assist the next target. Absolute silence should be the pleasure of the two members loading, and the captain, stationed between the two targets, should preserve it. All other persons should be excluded from a possibility of being seen or heard by the squad at the firing point.

JUDGMENT OF WIND.

Some of our riflemen have a specialty of judging wind and ordinarily should be deferred to. In securing a coach, great stress should be laid on his power to cope with this wary enemy. Having one, even though not the best, his intent attention entitles him to preference in judgment.

JUDGMENT OF LIGHT.

All eyes are not affected by light equally, and it is desirable that the shooter give that individual attention, relying somewhat on the comparative difference in the effect on his eye and the shooter who precedes him. The coach only remarking on radical changes.

INSTRUMENTS.

The coach should keep a close watch on the instruments, as they affect all alike, especially where slight variations in elevation of hit are accompanied with even an indication of variation in the barometer. During very hot days the difference will increase between the wet and dry thermometer until the approach of nightfall, when it will decrease again. Not so much stress need be laid on this, as each day for weeks may serve to give an example for another, but if a shower comes on, skill with these two instruments is absolutely necessary.

ELEVATIONS.

Riflemen have heretofore paid deference to the judgment of others on right and left shooting, ignoring deviations in elevation, on the score that the previous shooter held badly. The target is twelve feet wide and only six feet tall. If a shot misses the inner right or left it may count two. If it misses up or down it counts nothing. Where the greatest percentage of loss lies, there the greatest percentage of caution should obtain.

If No. 1 goes low, in the interest of the team, he should own up if he held badly, and especially so if the next shooter is to come to grief by his error. If he claims to have held perfect, some element has changed which the coach should fathom, and allow for accordingly; failing to see any change in elements he should divide the allowance, cautioning No. 2 to hold perfect to prove the defect.

HOLDING.

In team shooting perfect holding is intensely necessary. The position should feel right or the shooter should get up and lay down again. The eye should come up to the sight comfortably, and the white surrounding the bull's-eye should be held alike through the sights each time.

PICKING A TEAM.

"Fair play is a jewel." Many interpret that sentiment in the selection of a team, as giving the idea that each man should shoot on his individual merits without coaching. If individual skill was to be the rule in the match, the ground would be correctly taken; but men who shoot onto a team in that way are liable to be contumacious throughout the shooting, for the purpose of individual record; while, if team shooting was to be indulged in in the selection, good holders and good judges of

some elements, but lacking in what could readily be supplied them by a coach, would prove sufficiently tractable to submit to discipline.

To narrow down the list of competitors on the record of the first two days is an exploded idea; several days should be allowed all, and coaching should be courted, thus developing elements vastly more necessary to good team shooting than individual prowess that may never be placed to the advantage of the team.

When the number of competitors is to be reduced at all, it should be to the final number of double the number of the team, which number should stand throughout, at the same time four coaches, four spotters and four scorers should be chosen, making a sett for each target of four shooters. They should be regularly changed to different sets of fours, and each coacher's final average should determine as to coachers just as much as final average determines the team. The team should be finally chosen so as to admit of three practice days as a team entire—coach, spotter and scorer as carefully as the shooter. The captain should be chosen by the sixteen; four practice days before the final selection of the team he should immediately apply himself to finding out the different methods of loading and cleaning, submitting erroneous methods to the sixteen for consideration. The failure of any of the members to experiment properly on any improvement suggested would go far towards ostracizing him in the final selection. An Adjutant should be had to keep scores, compile them, and convey the captain's instructions. A Quartermaster should be appointed to provide transportation, meals, tents, and care for the property generally. An Instructor might act until the selection of Captain takes place.

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## RULES AND REGULATIONS OF ASSOCIATIONS.

Regardless of the familiarity with which you think you know the rules of *your* association, never go to a strange range or enter a match anywhere *without fully* informing yourself as to *the regulations you are to be guided by.* The set of rules and regulations printed herein are probably the most perfect and more liable to have all of the restrictions necessary. Do not, however, rely on them for any other range than Creedmoor.

THE NATIONAL RIFLE ASSOCIATION

### REGULATIONS

FOR THE GOVERNMENT OF COMPETITIONS UPON THE RANGE AT CREEDMOOR, L. I.

1. All meetings for competitions will be conducted by an Executive Officer, wearing a *tri-colored* badge, aided by a Statistical Officer, wearing a *blue* badge, and assistants, wearing *red* badges.

2. The Executive Officer shall have control of the range for the conduct of matches, and shall give such directions to the employees of the Association as in his judgement are necessary for the proper management of the same, and for the preservation of order.

3. The Executive Officer and his assistants are required to see that the regulations, and such directions as the Executive Officer may give, are rigidly complied with by competitors and all other persons upon the range grounds.

4. During the progress of a match they will see that no one, except the officers and employees of the Association, the competitors and the score-keepers, is permitted within the ropes.

5. They will see that the squads of competitors are stationed not less than four yards in rear of the firing points, and that each competitor remains there until called by the score-keeper to take his position at the firing point, and until he has completed his score. The score-keepers will be seated close to and in rear of the firing point stakes.

6. Score-keepers shall, as each shot is signalled, call in a loud voice the name of the competitor and the value of the shot, and at the conclusion of the score of each competitor announce in like manner his name and total score.

7. All competitors shall be allowed to examine the records of the score-keeper during the progress of the match.

8. Any competitor feeling himself aggrieved by the ruling of the Executive Officer, may make to the Secretary a statement of his grievance

in writing, giving the names of two or more witnesses in the case, which shall be handed at once to the Executive Committee for its consideration. The decision of the Executive Committee shall be final, subject, however, to the direction of said committee, or any two members of it, to refer the matter to the Board of Directors for its decision.

9. The Statistical Officer shall have charge of all statistics connected with the matches, and shall direct the services of the clerical employees at the Spring and Fall meetings.

II.—Rifles.

The rifles allowed to be used in the competitons are—1st. Military Rifles; 2d. Any Rifle; and must comply with the following conditions, viz.:

1. Military Rifles, of bona fide pattern, minimum pull of trigger six pounds, sights strictly in accordance with regulation pattern. Filing any of the sights, or using them in any other way than as originally intended, is prohibited, except that the sliding-bar of the rear sight may be inverted, and a single line drawn to mark the centre. Sights may be blackened, but not whitened or colored. Any pad or shoe, for the heel of the butt is disallowed.

2. Any Rifle, maximum weight ten pounds, minimum pull of trigger three pounds, sights of any description, except telescope, magnifying and such front aperture sights as solid discs or bushes pierced in the centre, which cover the target so as to conceal the danger signal when displayed. No stirrup constructed of metal or other substance, connected to the rifle by straps of any kind, for the purpose of taking up or lessening the recoil of the rifle, will be allowed in any matches of this Association.

3. The competitors shall submit their rifles and ammunition for inspection whenever required.

4. No hair triggers will be allowed.

5. No fixed artificial rests will be allowed.

6. In all matches breech-loading rifles must be loaded at the breech only.

7. "In all competitions confined to the use of breech-loaders, the guns shall be loaded at the breech with fixed ammunition."

III.—Ammunition.

1. For the regular National Guard competitions, ammunition will be furnished by the State and issued to competitors on the ground.

2. In all other competitions, unless otherwise specified, any ammunition may be used, and must be provided by the competitors.

3. Cartridges may be purchased at the office of the Superintendent of the Range on the Grounds.

The targets are divided into three classes, of the following sizes:

1. Third Class, to be used at all distances up to and including 300 yards.—Target 4x6 feet.

Bull's eye, circular, 8 inches in diameter.
Centre, " 26 " "
Inner, " 46 " "
Outer, square, 4 feet x 6 feet.

2. SECOND CLASS, to be used at all distances over 300, to and includ-600 yards.—Target 6x6 feet.

Bull's eye, circular, 22 inches in diameter.
Centre, " 38 " "
Inner, " 54 " "
Outer, " 70 " "

3. FIRST CLASS, to be used at all distances over 600 yards—Target 6x12 feet.

Bull's eye, circular, 36 inches in diameter.
Centre, " 54 " "
Inner, square, 6 feet x 6 feet.
Outer, " 6 feet x 12 feet.

V.—MARKING, SCORING AND SIGNALING.

1. Bull's eye counts 5; signal white circular disc.
Centre " 4; " red "
Inner " 3; " white and black "
Outer " 2; " black "
Richochet " R; " red flag waved twice right and left in front of the target. Ricochet hits will be marked out after the flag signal.

2. When a shot strikes the angle iron upon which the target stands, the marker will open the trap and raise and lower his flag three times in front of the target.

3. When a shot strikes any part of a second-class target outside of the boundary of the "outer," he will open the trap, so as to display the trap danger signal (red square disc) and close it again without marking out the hit.

4. Any objection to the scoring of a shot as signaled, or to one not signaled, must be made before another shot is fired.

5. Any alteration of a scoring ticket must be witnessed by an officer in charge of the firing point, and endorsed with his initials.

VI.—MATCHES.

1. The commencement of matches at the Spring and Fall meetings will be signaled by the firing of two guns, 15 minutes apart. The first will be the signal for competitors and score-keepers to assemble at the firing points, and the second to commence firing.

2. The matches will take place, if possible, in the order named in the programmes. The time for firing them, together with any deviation from the programmes, will be posted upon the bulletin board as long beforehand as practicable.

3. Competitors are requested to frequently examine the bulletin

board, where they will learn the targets to which they are assigned, and other neccessary information.

4. Temporary discontinuance of matches on account of bad weather, which will be in the discretion of the Executive Officer, and discontinuance for noon-day intermission, will be signaled by the firing of a gun. In each case the competitions will be resumed upon the firing of two guns, as in the commencement.

5. No practice will be allowed upon the range on any of the days of the meetings for competitions. This does not apply to days upon which special matches of the Association, or of affiliating Associations or Clubs, take place.

### VII.—Entries.

1. For the State prize, and all other competitions open to National Guard organizations, the teams shall (unless otherwise specified) consist of twelve from each regiment, battalion, company or troop.

2. All regimental officers shall be eligible as members of such teams.

3. In all cases competitors for the State or other prizes offered to military organization, must be regularly enlisted members in good standing of the regiment, battalion, company or troop which they represent, and shall have been such for at least three months prior to the match for which they are entered; all entries must be made for full teams.

4. Entries should be made at the office of the Association, 23 Park Row, New York, at least two days preceding the commencement of the meeting at which the match is to take place. A charge of 50 per cent, additional will be made for all entries made after that time.

5. A member of the Association entering for a match on the range must exhibit his member's badge.

6. A register ticket may be transferred at any time before the firing for the match has commenced, by exchanging it at the office of the Statistical Officer for one having the name of the new holder. Any erasure, or the substitution of one name for another, will render the ticket invalid.

7. Competitors who are prevented from being present at any meeting shall have the entrance fees they have paid returned after the meeting, provided that they send their tickets and give written notice to the Secretary before the day on which the prize for which they have entered has been announced for competitors.

8. Competitors prevented from competing by illness will receive back their entrance fees in full, on production of a medical certificate and their entry tickets.

9. Post entries are those made after the entry books are closed at the office of the Association.

10. The holders of post entry tickets may be ordered to fire whenever target accommodation can be provided.

11. Should the holders of post entry tickets be precluded from competing by deficiency of target accommodation, their entrance fees will be

returned to them, the Executive Officer not being able to guarantee accommodation for all such entries.

12. No post entries shall be made for any competition after the firing in such competition has commenced.

### VIII.—Shooting.

1. Two sighting shots shall be allowed to every competitor at each distance, on payment of ten cents a shot.

2. Tickets for the sighting shots will be sold upon the ground, and will be good for any match during the meeting. Competitors must decide, before firing, upon the number of sighting shots they will take, and hand the tickets for the same to to the scorer. Sighting shots cannot be counted upon a score.

3. Competitors who, at the close of the firing on any day, have not completed the number of rounds prescribed by the conditions of a competition, shall be allowed one sighting shot when such competition is resumed, without charge.

4. In all National Guard competitions, the competitors shall place themselves at the firing point by twos, who shall fire alternately until they have fired all their sighting and competitive shots.

5. In other competitions the competitors shall fire their sighting and competitive shots alternately throughout the squad.

6. In all National Guard competitions, competitors shall shoot in the authorized uniform of their corps.

7. Competitors may wipe or clean out their rifles during any competition, except those restricted to the use of military rifles.

8. Whenever the danger flag is displayed, competitors about to fire will be required to open the breech block of their rifles (if breech-loaders). If they leave the firing point they must draw the cartridge.

9. No two competitors shall be allowed to shoot with the same rifle in the same match.

10. Any competitor delaying his squad may be passed by. In no case will the firing be delayed to enable a competitor to procure a rifle.

11. In all military matches each team will be limited to an average of one minute and a half per shot, for each squad, to complete its score.

### IX.—Position.

1. In all matches (except those for cavalry carbines) the position up to and including 300 yards, shall be standing. The left elbow may be rested against the body, provided the little finger of the left hand is in front of the trigger guard.

2. In all National Guard infantry matches, at 400 yards, the position shall be kneeling ; at distances above 400 yards any position may be taken in which the head is towards the target.

3. In cavalry carbine matches the position, at 200 yards, shall be standing ; at 300 yards, kneeling ; over that distance, in any position (as prescribed for infantry.)

4. In all other matches, at distances above 300 yards, any position may be taken without artificial rests to the rifle or body.

5. One-armed competitors shall be allowed to use false arms without extra support in the standing or kneeling positions, and to assume any position in the use of military rifles, at distances above 400 yards, the same as is allowed for *any rifles*.

6. Sighting shots may be fired in any position, without artificial rests.

7. In all cases the gun shall be held clear of the ground.

### X.—Ties.

1.—Ties shall be decided as follows :

#### A.—In Individual Shooting.

1. When the firing takes place at more than one distance, by the score made at the longest distance ; and if still a tie, and there be three distances in the competition, by the score at the second distance.

2. By the fewest MISSES.
3. By the fewest OUTERS.
4. By the fewest INNERS.
5. By the fewest CENTERS.

6. If still a tie, by inverse order of shots, counting singly from the last to the first.

7. By firing single shots at the longest range.

#### B.—In Team Shooting.

1. By the aggregate scores made at the longest distance.

2. By the fewest MISSES.
3. By the fewest OUTERS.
4. By the fewest INNERS.
5. By the fewest CENTERS.

6. By the competitor on each side who has made the highest score firing five rounds at the longest distance.

II.—The names of competitors who have to shoot off ties will be posted on the bulletin-board as soon after each match as practicable.

III.—When the ties are shot off, one sighting shot shall be allowed without charge.

IV.—Competitors not present at the firing points at the hour named for shooting off ties, lose their right to shoot.

V. If, having forfeited their right to compete, they shall still be within the number of prize winners, they shall take any prize that may be allotted to them by the Executive Committee.

### XI.—Prizes.

1. Prize winners will, upon application to the Statistical Officer on the range, receive certificates, which must be given up on receiving the prizes.

2. Prizes will be delivered on the range ground at the close of the meeting, under the direction of the Executive Officer.

3. The principal prizes at the annual Fall meeting will be formally presented to the winners at the State Arsenal, Seventh Avenue, corner Thirty-fifth street, N. Y., on the Saturday following the last day of such meeting, at 8 P. M., unless otherwise announced. Winners who will be unable to attend are requested to give notice at the office of the Association.

4. All prizes not claimed within one month after the match at which they have been won, shall be forfeited to the Association.

XII.—Penalties.

Competitors must make themselves acquainted with the regulations, as the plea of ignorance of them will not be entertained.

1. Any competitor who fires in a name other than his own, or fires twice for the same prize, shall be disqualified from ever again competing at the prize meetings of the Association, or for any prize offered to the National Guard elsewhere.

2. Should a competitor lose his register ticket, omit to take it to a firing point, fail to attend at the prescribed hour, or give a wrong ticket, and so by his own neglect miss the opportunity given to him of competing for the prize for which his ticket was issued, his claim in regard to such competition shall be cancelled.

3. Any competitor who shall be detected in an evasion of the conditions prescribed for the conduct of any match, shall be disqualified from further competition during that meeting, and forfeit his entrance fees; or if he is guilty of any conduct considered by the Executive Commttee as "discreditable," he shall be disqualified from ever again competing at the N. R. A. prize meetings, and shall forfeit all prizes won by him at the current meeting.

4. Any member of a squad or firing party who shall fire a shot from any other firing point after the hour prescribed for his squad to fire, and before he has completed his score (except in pursuance of orders), shall be disqualified in that competition.

5. Any competitor discharging his rifle accidentally, either by his own want of care, or by reason of any defect in the rifle, will be liable to disqualification.

6. Any competitor refusing to obey any instructions of the Executive Officer or his assistants, or violating any of these regulations, or being guilty of unruly or disorderly conduct, or being intoxicated, will be immediately ruled out of all other competitions, and forfeit his entrance fees.

7. Any person, whether a competitor or not, interfering with any of the firing squads, or annoying them in any way, will be at once expelled from the ground.

8. Any competitor firing when the danger flag or trap disc is shown at the target or firing point, or knowingly discharging his rifle, except at a target to which he has been assigned, or into the ground, and as may be directed by an officer, shall be debarred from further competitions during the meeting, and shall forfeit his entrance fees. This shall not apply to a competitor accidentally firing at the wrong target when no danger disc is up.

9. Any competitor firing on a wrong target in any match, will be fined $3, or will be debarred from further competition in such match, or both, in the discretion of the Executive Officer.

10. Any person discharging a rifle or snapping a cap within the enclosure, except in accordance with the regulations for shooting, may, at the discretion of the Executive Officer, be required to leave the ground, and be debarred from further competition.

11. Any competitor or other person found with a loaded rifle, except at the firing points and when about to shoot, may be debarred from further competition during that meeting.

12. Any competitor in National Guard matches, using any other ammunition than that issued to him on the ground, or in any way tampering with that so issued, shall be disqualified for all future military matches.


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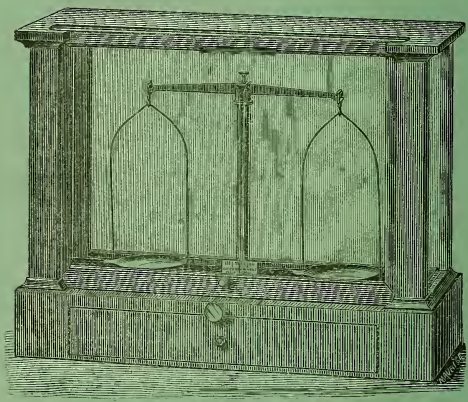

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## MODEL OF 1876

70 Grains of Powder, 350 Grain Bullet, Calibre, 45-100.




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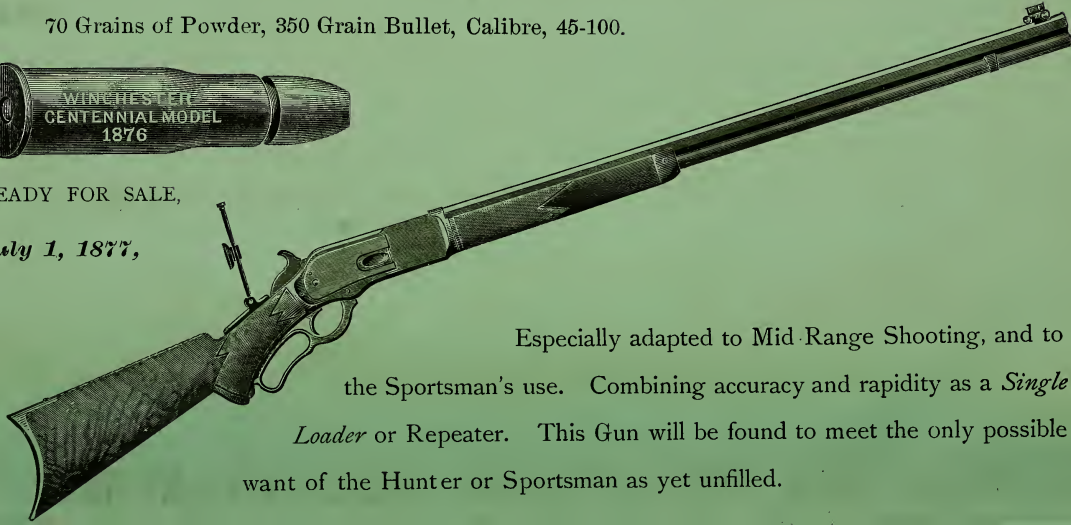

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Winner of the Rapidity and Accuracy Match at Creedmoor in 1876.

**FOR THE HUNTER, INDISPENSABLE.**

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It is Simple, Strong, Light, Handy, Accurate, and Unequaled for

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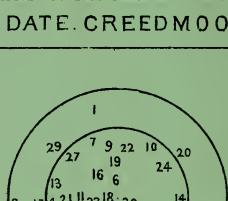
*Brooklyn, Dec. 15th 1876.*

*Capt. E. A. Perry, Dr. Sir. You ask for my permission to publish enclosed score. You have it. It is the best I have ever accomplished, and is due to your "Coaching." I am satisfied, that with your knowledge of the art, you can produce equal results with anyone who will hold the rifle properly.*

*Yours Fraternally,* **E. H. MADISON.**

## 1,000 YD'S. DATE. CREEDMOOR, NOV. 25TH 1876.

No. 15 UNACCOUNTABLE.




1ST PRIZE

N. R. A. BRONZE MEDAL TO AMATUER RIFLE CLUB.

| TOTA |
|---|
| 136 |
| POSSIB |
| 150 |

| | | SUMMARY. | | | | WIND. | |
|---|---|---|---|---|---|---|---|
| PAGE | OCCASION | DATE | TIME | WEATHER | LIGHT | DIRECTION | FORCE |
| ABOVE | N.R.A. BR. MEDAL | NOV. 25. | 2 O'C | CLOUDY | GREY | 9 O'CLOCK | B TO A. |

*From the Turf, Field and Farm, Dec. 1, 1876.*

### Long Range Marksmanship at Creedmoor.

On Saturday the bronze medal drew out a field of contestants at the 1,000 yard range, and being the last match day of the season and the weather exceptionally fine, it was expected that many good shots would put in an appearance. Mr. E. H. Madison was fortunate enough to carry off the prize, making 22 bull's-eyes out of thirty shots, and 136 points out of a possible 150—a remarkable score at the 1,000 yard distance, notwithstanding a clear miss on his fifteenth round.

Unfortunately, the match was begun at so late an hour that several gentlemen could not have an opportunity to complete their scores; among them were Messrs. Weber, Holland, Sandford, Blydenburgh and Tiffany. The following is a summary:

Open only to members of the Amateur Rifle Club; distance, 1,000 yards; two sighting and thirty scoring shots; weapons, any rifle; entrance fee, $1.

| NO. OF SHOT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCORE | 4 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 |
| ELEVATION | 4° | 3⁵⁹ | · | · | · | 3⁵⁹½ | · | 3⁵⁹ | 3⁵⁹½ | 3⁵⁹¼ | · | · | · | · | · |
| WIND GUAGE | 7L | · | 7½ | 7 | · | · | 6½ | · | · | 7 | · | 6 | · | 4½ | 5½ |
| " DIRECTION | 9 O'C | · | · | · | · | · | · | · | · | · | · | · | · | · | · |
| " FORCE | B | · | · | · | · | · | · | · | · | · | · | · | · | A | · |
| WEATHER | LIGHT CLOUDS | BRIGHT | MIRAGE | | | | | | | | CLOUDY | | | | |
| LIGHT | GREY | " | " | | | | | | | | GREY | | | | |
| THERMOMETER | 49° | · | · | · | · | 50 | · | 51 | · | 50 | 49 | 48 | · | · | · |
| BAROMETER | 29.85 | · | · | · | · | · | · | · | · | · | · | · | · | · | · |
| HYGROMETER | NOT USED | | | | | | | | | | | | | | |
| BULLET | WINCHESTER, 550 GRAINS | | | | | | | | | | | | | | |
| POWDER | HAZARD F.G. 100 | " | " | | | | | | | | | | | | |
| SIGHT | OPEN BEAD | | | | | | | | | | | | | | |
| RIFLE | REMINGTON CREEDMOOR | | | | | | | | | | | | | | |
| TIME | 20'CLOCK | | | | | | | | | | | | | | |

| NO. OF SHOT | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCORE | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 5 | 4 | 5 |
| ELEVATION | · | 3⁵⁹ | · | · | 3⁵⁸¾ | 3⁵⁸½ | · | 3⁵⁷¾ | 3⁵⁷½ | 3⁵⁷ | 3⁵⁷½ | 3⁵⁸ | · | · | · |
| WIND GUAGE | · | 4½ | 4 | 4½ | 5½ | 6 | 5 | 4½ | · | 4 | · | · | · | · | · |
| " DIRECTION | · | · | · | · | · | · | · | · | · | · | · | · | · | · | · |
| " FORCE | · | ½ OF A | · | · | A | · | · | ½ | OF A | | · | · | · | · | · |
| WEATHER | CLOUDY | | | | | | | | | | | | | | |
| LIGHT | | | | | | | | | | | DARK GREY | | | | |
| THERMOMETER | · | 47 | · | 46 | · | · | · | · | · | · | · | · | 45 | · | · |
| BAROMETER | 29.80 | · | · | · | · | · | · | · | 29.75 | | · | · | · | · | · |
| HYGROMETER | | | | | | | | | | | | | | | |
| BULLET | | | | | | | | | | | | | | | |
| POWDER | | | | | | | | | | | | | | | |
| SIGHT | | | | | | | | | | | | | | | |
| RIFLE | | | | | | | | | | | | | | | |
| TIME | | | | | | | | | | | | | 4 | O'CLOCK | |

## SUMMARY.

| ER | BA ROM ETER | HY GROM ETER | BULLET | POWDER | RIFLE | SIGHT | SCORE |
|---|---|---|---|---|---|---|---|
| 8 | 29.80 | — | W.550 | F.G.100 | R.C. | O.B. | 136 |

### ELEVATIONS.

| 1.100 | 800 | 900 | 1.000 |
|---|---|---|---|
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E. H. Madison.....4 3 4 5 5 5 5 5 5 5 5 5 5 0 5 4 5 5 4 5 5 5 5 3 5 5 5 4 5—136
I. L. Allen.....5 4 5 4 5 0 5 5 5 3 5 5 5 2 4 5 4 5 4 2 4 4 4 5 4 5 4 5 5 4—126
H. S. Jewell.....5 5 5 5 5 0 0 4 5 5 4 3 5 3 5 3 5 5 5 5 3 5 5 5 5 4 5 5 3 4—126
W. Hayes.....4 4 3 3 4 2 5 3 5 5 4 4 4 3 4 4 5 5 5 5 4 3 5 5 3 4 5 5 5 5—125
Dr. Raymond.....5 5 5 3 3 5 3 3 5 3 3 4 5 5 5 5 5 3 5 5 0 0 5 5 5 4 5 5 4—123
H. Fisher.....4 5 5 5 5 4 0 3 4 4 3 5 3 5 4 2 3 5 0 4 5 5 5 5 4 4 5 5 5 2—118
G. W. Yale.....4 3 0 4 5 3 3 3 3 5 3 3 5 5 4 5 5 4 3 5 5 5 1 4 5 4 3 5 3 4—117
J. P. Waters.....0 2 5 4 4 4 5 1 R 3 5 4 4 5 4 5 3 3 3 5 5 0 5 5 4 5 5 5 5 4 4—116
L. M. Ballard.....R 5 5 3 4 3 4 5 4 5 4 4 5 4 4 4 3 4 5 3 5 3 0 3 0 0 5 5 4 5—108
C. E. Huntington...0 0 0 2 3 3 4 2 2 0 5 5 2 0 5 2 0 3 5 3 5 3 3 3 5 2 2 3 3 0— 75

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*Have always in stock a great variety of*

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*in every style of case, from the SIMPLEST to the MOST COSTLY.*

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**Manufactured by**

## THE PROVIDENCE TOOL COMPANY,

*Providence, R. I.*

For symmetry of form, certainty of action, perfection of workmanship, and accuracy at the longest ranges, they are unrivalled.
Our MID-RANGE GUNS, VICTORIOUS OVER ALL COMPETITORS at the Centennial International Short-Range Match at Creedmoor, September 12th, 1876.
BUT TWO OF OUR GUNS USED, OUT OF ONE HUNDRED AND TWENTY IN THIS MATCH, WINNING FIRST AND FOURTH PRIZES.
Military Rifles of regular model, selected for accuracy, for the use of Military and G. A. R. teams always on hand.

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All our Rifles are bored expressly for accuracy, and rifled on the so-called HENRY system, which experiments in this and other countries has shown to give the most uniform results, being less liable to lead, and producing less friction than any other style of rifling in use. Send for ILLUSTRATED CATALOGUE and PRICE LIST.

**CENTENNIAL COMMISSION.—REPORT ON AWARDS,—"PEABODY-MARTINI RIFLE."**

"As a Military Arm, combining strength, simplicity, high quality of workmanship, ease of manipulation, with accuracy and rapidity of fire. Using a Central Fire Metallic Cartridge, and ejecting the discharged shell unfailingly."

[See next two pages.

# PEABODY-MARTINI LONG-RANGE RIFLES.

CREEDMOOR PATTERN.

*Manufactured by*

## Providence Tool Company, Providence, R. I.

Half octagon, Steel barrel, 32 inches long; Calibre, 44-100; Weight, just under 10 lbs.; Pull of Trigger, 3 lbs.; Stock, hand made, from extra choice black walnut, with pistol grip, highly polished. Grip and fore end checked, sides of breech-frame handsomely engraved. Peep rear sight, with Vernier scale, interchangeable from *wrist* to *heel*, giving elevation for 1,500 yards on wrist, or 1,100 yards on heel. Interchangeable globe and open bead front sight, with wind gauge and spirit level. Morocco case for sights. **Price, $125.**

CREEDMOOR PATTERN, No. 2, is a duplicate of the above, except that the sides of breech-frame are not engraved. **Price, $110.**

WHAT CHEER PATTERN, LONG RANGE RIFLE, is the same as CREEDMOOR PATTERN, No. 2, except it has no *Pistol Grip* on stock. **Price, $100.**

All the above rifles use the same cartridge, using 100 to 110 grains powder and 550 grain bullet.

Send for ILLUSTRATED CATALOGUE and PRICE LIST.

☞ *See pages before and after this.*

# Peabody-Martini Mid-Range Rifles.

Manufactured by PROVIDENCE TOOL CO., PROVIDENCE, R. I.

*For Mid-Range and Off-Hand Target Practice.*

Mid-Range Rifle No. 1, Half Octagon, Steel Barrel, 28 or 30 inches long; Calibre, 40-100; weight, 9 to 9 1-2 lbs.; pull of trigger, 3 lbs. Stock; hand made, from selected black walnut, highly polished, with Pistol Grip. Grip and fore end handsomely checked. Hollow butt plate, peep rear sight, with Vernier scale; globe front sight, with wind gauge and spirit level. Price, $75.

No. 2. Half Octagon Steel Barrel, 28 or 30 inches long; Calibre, 40-100; Weight, 9 to 9 1-2 lbs.; Pull of Trigger, 3 lbs.; Stock, hand made from selected Black Walnut, highly polished, with checked Grip and fore end. Hollow butt plate, graduated peep rear Sight; Globe front Sight. Price, $60; if with Spirit Level, $65.

The above Mid-Range Rifles are chambered for a shell using 70 grains of powder and 380 grains of lead, for practice from 500 to 800 yards; or the same shell is loaded with from 55 to 60 grains powder and 300 grains of lead, with lubricating disc in shell, for hunting or practice from 200 to 400 yards without cleaning.

In good weather creditable scores have been made with these guns at a distance of 1000 yards.

Send for ILLUSTRATED CATALOGUE and PRICE LIST.

[☞*See two pages previous.*

| | SUMMARY. | | | | | WIND. | |
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| PAGE. | OCCASION. | DATE. | TIME. | WEATHER. | Light. | Direction. | FORCE. |
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| Thermometer. | Barometer. | Hygrometer. | SUMMARY. | | | | | ELEVATIONS. | | | |
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| | | | Bullet. | Powder | Rifle. | Sight. | Score. | 1.100 | 800 | 900 | 1.000 |

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*19 Maiden Lane, N. Y.*

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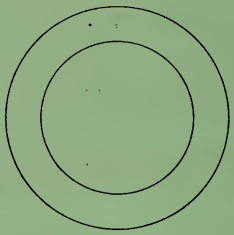

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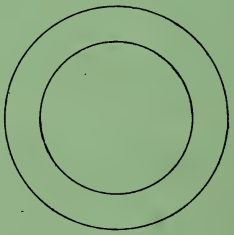

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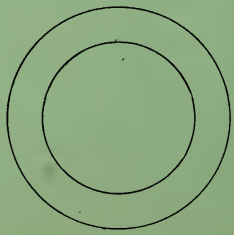

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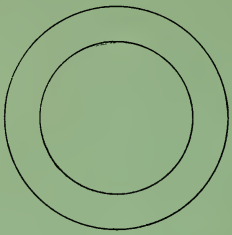

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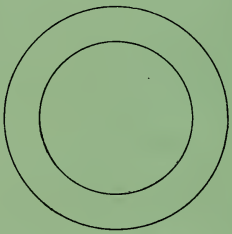

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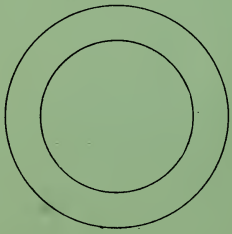

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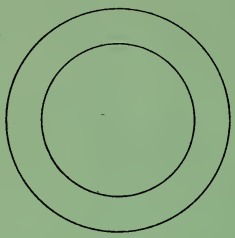

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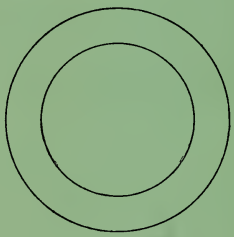

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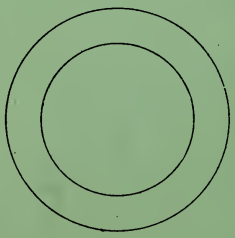

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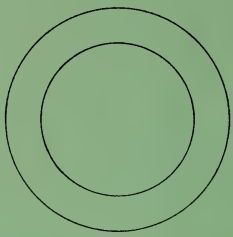

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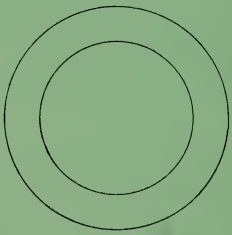

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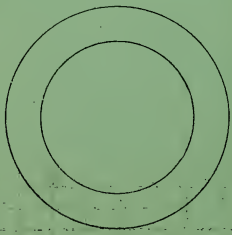

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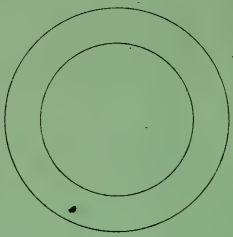
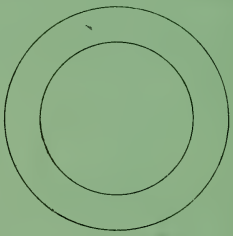


YDS DATE 187 TOTAL



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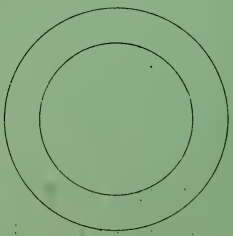

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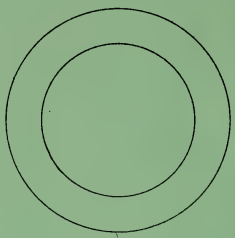

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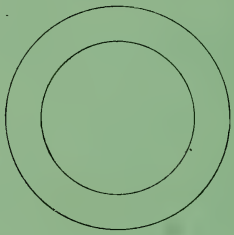

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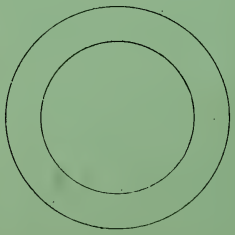
GRAND TOTAL



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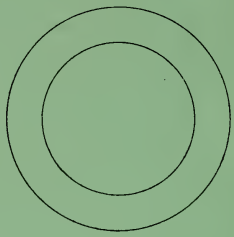

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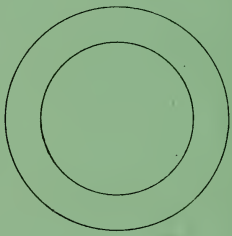

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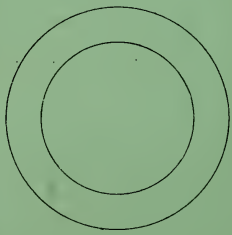

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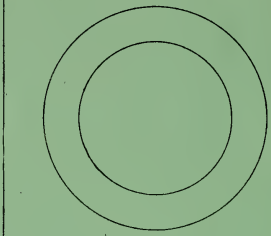
|  | |

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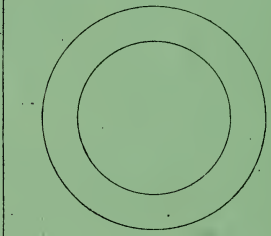
|  | |

| Yds Date 187 | TOTAL / GRAND TOTAL |
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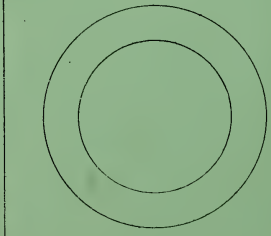
|  | |

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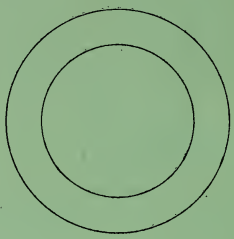
Yds Date 187 TOTAL



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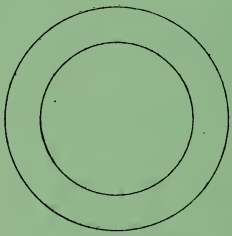

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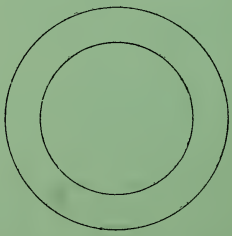

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| No of shot | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
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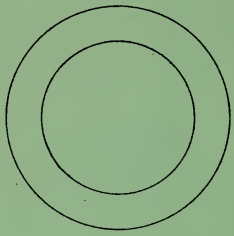
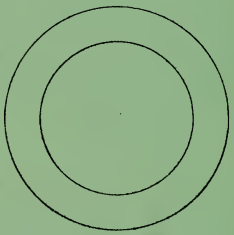
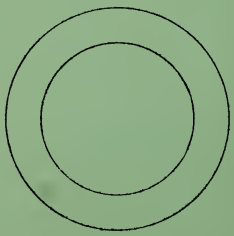


Yds Date 187 TOTA



Yds Date 187 TOTA GRAN TOTA



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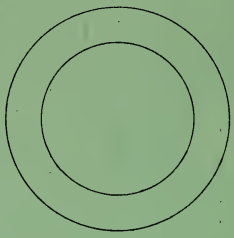

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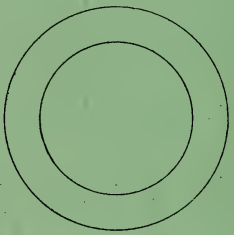
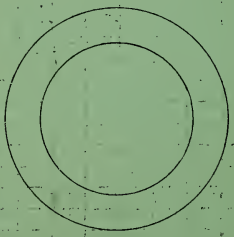


Yds Date 187 TOTAL

GRAND TOTA



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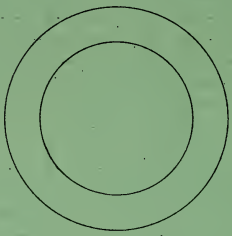

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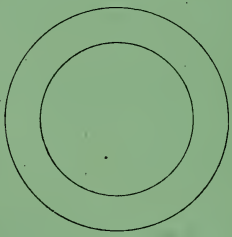

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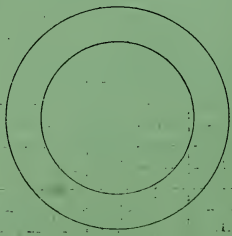

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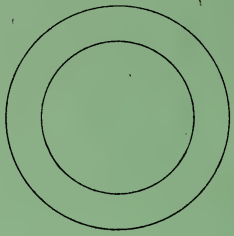

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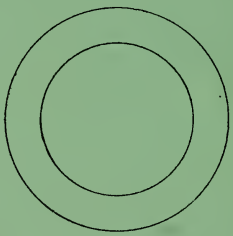

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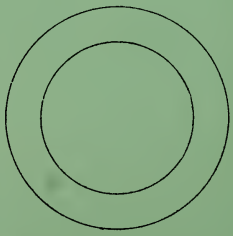

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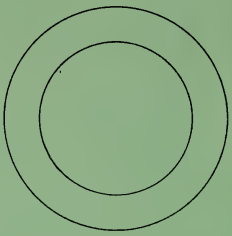
|  | |

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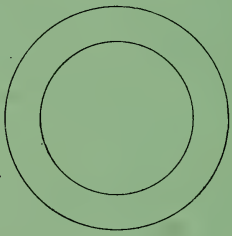
|  | |

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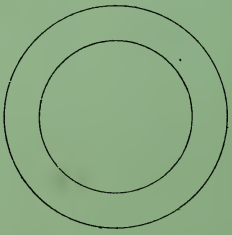
|  | |

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| No of shot | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
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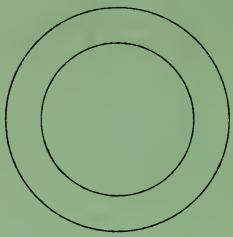
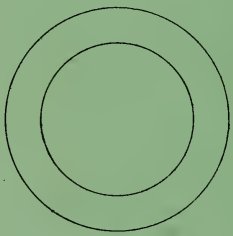


TOTAL

Yds Date 187



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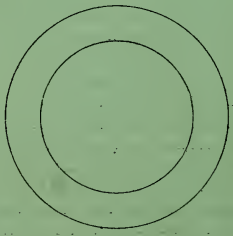
GRAND TOTAL



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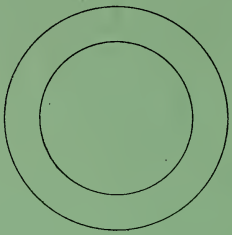

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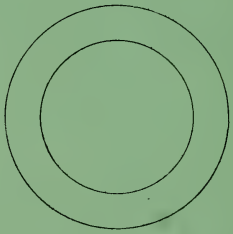

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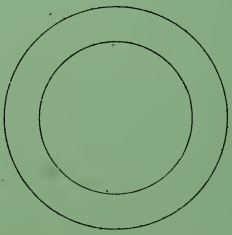

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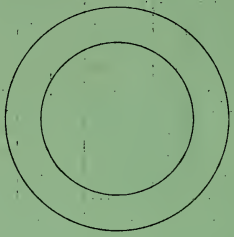

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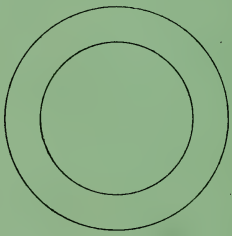

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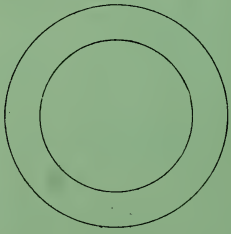

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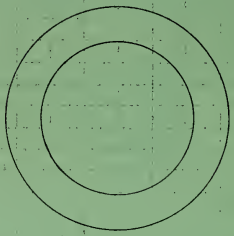

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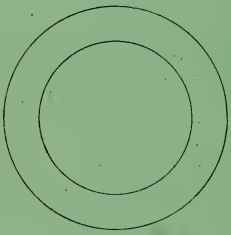

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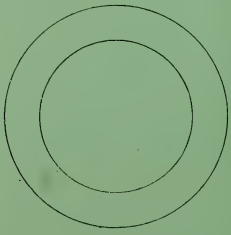

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TOTAL

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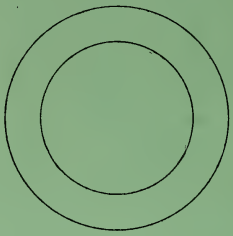

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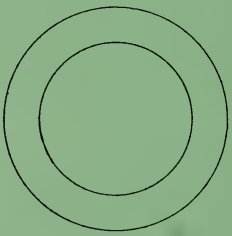

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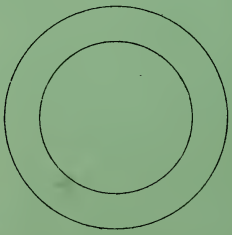

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| No of shot | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
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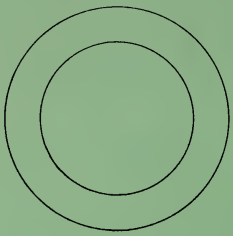

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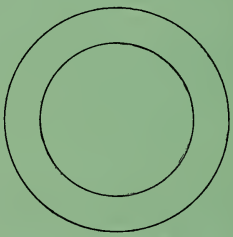
Yds Date 187



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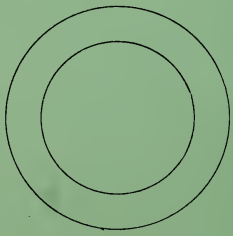

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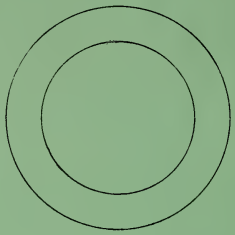

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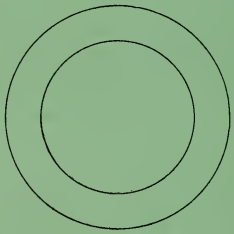

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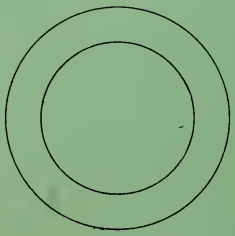

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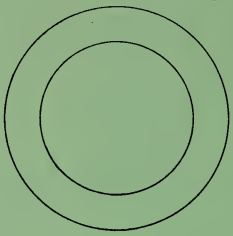

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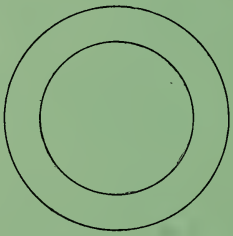

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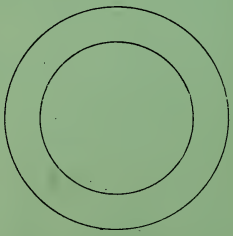

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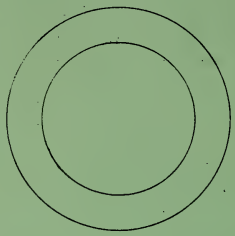

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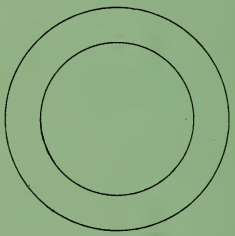

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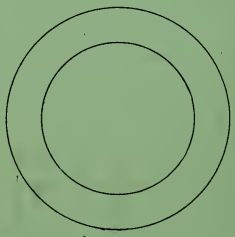

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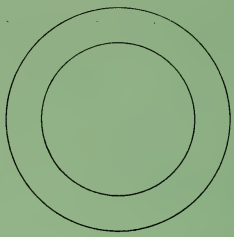

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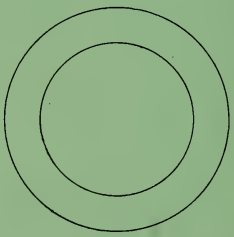

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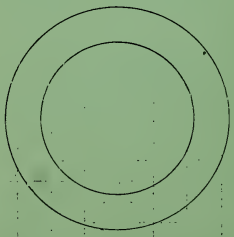

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| HYGROMETER | | | | | | | | | | | | | | | |
| BULLET | | | | | | | | | | | | | | | |
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| No of shot | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
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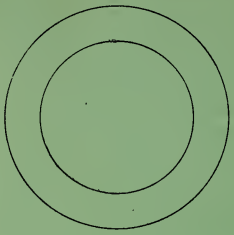
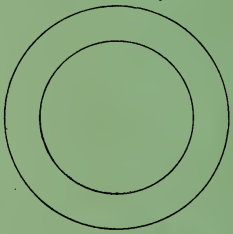
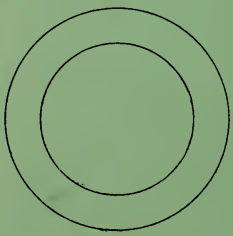


Yds Date 187 TOTAL



Yds Date 187 TOTAL GRAND TOTAL



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